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JOURNAL OF THE ASSOCIATION OF MILITARY SURGEONS

OF THE UNITED STATES.

EDITED BY

JAMES EVELYN PILCHER, M.D., L.H.D.,
MAJOR AND BRIGADE SURGEON OF UNITED STATES VOLUNTEERS;
CAPTAIN, RETIRED IN THE UNITED STATES ARMY,
PERMANENT SECRETARY OF THE ASSOCIATION.

VOLUME XIX



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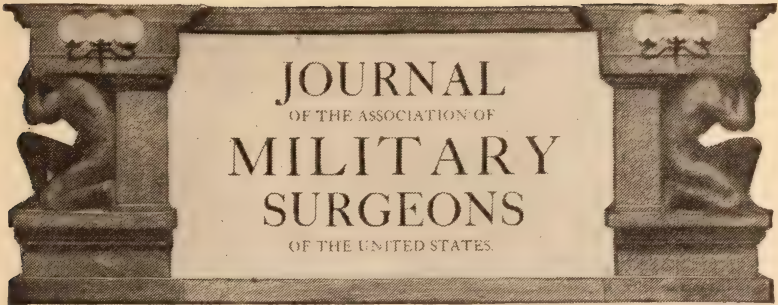
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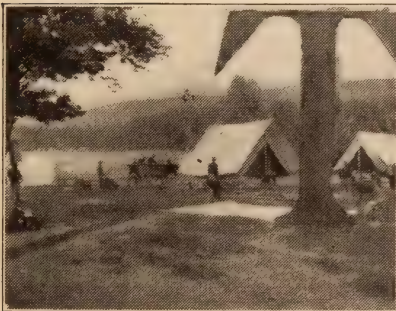
AUTHORS ALONE ARE RESPONSIBLE FOR THE OPINIONS
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THE PREVENTION OF DISEASE IN THE ARMY AND THE BEST METHOD OF ACCOMPLISHING THAT RESULT.*

By MAJOR CHARLES E. WOODRUFF,
SURGEON IN THE UNITED STATES ARMY,
AND
CAPTAIN FRANK T. WOODBURY,
ASSISTANT SURGEON IN THE UNITED STATES ARMY.

Part II.

THE PRINCIPLES OF FIELD SANITATION.



THE prevention of any particular disease in the army is based on the same biologic laws as in a civil community, so that it is not profitable here to mention rules which can be found in any text book of sanitation, nor to describe the basic laws of personal hygiene. The bar-

rack has an environment differing in no essential from any well

*Honorable Mention Essay in the competition for the Seaman Prize.

regulated civil community and its sanitation demands these rules and offers no unsurmountable obstacles. Indeed, the morbidity and mortality rates among soldiers in garrison are markedly less than among an equal number of young men in any civil community and no better proof is needed that the system which accomplishes such results must be essentially good, even if it does have minor faults like every other human contrivance. To be sure, much of the good result is due to the fact that soldiers are a picked lot of young men, of perfect health and under control, so that it is possible to attain good sanitary results even with a poor method, but making due allowance for all that, it must be conceded that the system is not vitally defective. The faults, such as they are, appear only when the army leaves the conditions of a civil community and goes into camp.

Major Arthur Griffiths (*Fifty Years of Public Service*) states that his regiment in the Crimea numbered one thousand men in September but in four months disease had reduced it to thirty effectives. In this war it is also reported that in eight army corps, 73 per cent were sick, 66 per cent of the cases being typhoids. Thousands of similar instances could be cited, but as it is common knowledge that we kill more of our soldiers in camp than the enemy does in battle, any further illustrations are a waste of time. In the field conditions then, are to be found the reasons why disease should appear. Something must be done as the deplorable camp illnesses still exist. For instance, in 1898, the finest army ever organized took the field but in a campaign of a few weeks, disease destroyed it as a weapon and its enfeebled remnants were gathered together at Montauk Point. At home it was almost as bad. The troops in Camp Thomas, Georgia, had a sick rate of $21\frac{1}{2}$ per cent and death rate of 2 per cent for four months, and all this was notwithstanding modern advances in sanitation.

It is a biologic law that there is a maximum number of any species of organism, which can be crowded into a given area. Should the food supply increase largely, an increased population results, but the moment the numbers exceed the maximum allowable density, the reduction begins through self poisonings,

diseases of crowds and endemic causes of death. This law applies to men as well as bacteria, and it is the law which is violated when armies take the field. Ordinarily the cause of increased mortality in the case of human overcrowding, is the easier transmission of infectious diseases, chiefly those of intestinal origin, for there is greater difficulty of disposing of the excreta.

The tremendous growth of modern cities with so little mortality, has been accomplished by the construction of expensive means of removing excreta from the vicinity of the food, water and living rooms. In a farming district, where the excreta are little in bulk and safely disposed of by natural decay, the means employed are primitive. Greater complexity is needed as crowding takes place, until we reach the enormously expensive sewage and water systems of modern cities. The expense per capita for excreta disposal is perhaps less in urban than in farming communities, where the expenses are paid by the individual families, but it appears enormous in the aggregate. If it is but one dollar a year in the country for labor and material, then a million dollars yearly is not too much to spend on the sewage of a city of a million people. This corollary of the law is not generally known, and when an army of 100,000 men is encamped, the expenses for proper disposal of excreta should be about 20,000 times more than the expenses of one farming family of five persons. We have been under the delusion that there should be no expenses at all for this most vital necessity of existence. One regiment in 1898 did not even have a latrine for ten days after camping! Hence it is almost an invariable rule, that new regiments in camp at once begin a system of living as though they were on a farm with no one within a mile to be injured by their excreta. It is now known, in this country at least, that 98 per cent of the regiments will take some typhoid fever to camp and it is at once spread through the imperfect means of removing excreta. A moving army leaves its excreta behind, hence we have the axiom of warfare—a moving army is a healthy army, an army in camp is a diseased army.

We have then reached the first or basic law of military sanitation. Armies in the field must take measures to insure the bur-

ial, cremation or removal of all excreta. It is the first law and it must be attended to before anything else, before the first tent is pitched, before the food is prepared, and before the soldiers even break ranks. There may be several men in the regiment with diarrhoea, and it is they who, in the first hour after camp is reached, may infect the ground where the kitchen is subsequently placed and it is they who keep up the infection of regiments which are moved to new camps, for experience shows that new infections begin immediately after the usual period of incubation. So important is this one law, that it deserves an essay of itself. It is so vital that no man should be considered fit to hold a commission or warrant who is not fully alive to its importance and who does not know how to accomplish its execution, and it must be executed regardless of cost. Failure to realize this one necessity was the prime cause of the scandalous conditions of the camps of 1898.

If an army is in motion, sanitary measures must of necessity be primitive in the extreme. Space does not permit description of details, but it may be stated that the men selected for the duty of preparing the latrines must be detailed before the day's march is begun, their tools and the shelter for the latrines must be the last things loaded so as to be the first unloaded for use, and the moment the camp site is selected the latrine detail must put up the shelter and dig the pits. A sentinel must guard each latrine and see that each man covers his own discharges with powdered earth removed from the pit. Urinating on the ground is to be particularly prohibited as typhoid and other germs are excreted through the kidneys. The last thing done before a day's march is to fill in the pit level to the surface. At no time during the stay in camp should there be any excreta exposed to flies.

These primitive means will suffice for a few days, but it is evident that new pits will soon be required and the camp site be riddled with them. It has been recommended that whenever practicable the pits should be burned out once or twice a day with straw saturated with coal oil, but leaving out of the question the fact that coal oil is not available as a rule, the measure is to be condemned as it does not prevent the entrance of flies in the

intervals between burnings. Nothing except covering the excreta will suffice. In rainy weather the matter is very difficult to attend to, and there are some occasions when troops must be camped on such low ground that the pits fill with water. In these conditions little can be done. It is a situation that must be abandoned the instant it is permissible, and in the meantime undue sickness and death are the penalties of the military necessity of placing men where life cannot be permanently sustained in dense masses.

In more or less permanent camps the above system for the march must not be used under any circumstances. It is here necessary to adopt measures approximating urban methods of the removal of excreta. If the camp is to be permanent and used year after year a sewer system is the only plan allowable. Whether it is to drain into a water course or into huge pits far removed from the camp, depends entirely upon local conditions. Any compromise in this matter is a murderous economy, dreadfully expensive in the long run.

There are halfway conditions, not really in the field where sanitary equipments are not attainable, and yet not permanent camps with sewerage like a city. Such are the camps called into being for a short time in war to hold a district or in maneuvers like our state camps and coast exercises. Here it is possible to prepare something beforehand yet a permanent equipment is too expensive and impracticable. Experience shows that the only proper arrangement in such cases is one of the forms of trough latrines with odorless carts for the daily removal of excreta from the camp. It is dangerous of course, for some of the material must be kept on hand constantly and flies have a chance for their work, but the danger is minimized by keeping the excreta covered, by using milk of lime freely or solutions of some of the numerous disinfectants which are at least obnoxious to flies.

In the small semi-permanent encampments or garrisons in the Philippines, the dry earth system was the only practicable make-shift, and although objectionable from the carelessness of soldiers who would not cover their own deposits, it was satisfactory where the officers were efficient. The iron pans were

emptied and cleaned daily, and it was the nearest possible approach to immediate burial. It is regrettable of course that it is necessary to adopt such primitive makeshifts in permanent camps instead of a sewer system which will remove the excreta at once to where they will do no harm, but as the money for this purpose will never be furnished it is necessary to do the best we can. The more temporary the camp or the more often the marches, the less we can do except immediate burial. It is to be kept in mind that as we approach the hostile area, our transportation drops behind, and the soldier must get along with less and less equipment, and we will not be able to procure any of the things mentioned as necessary for more permanent camps. It is then a matter of immediate burial or as near thereto as possible and of the severe punishment of any man who pollutes the camp ground.

Lieutenant Colonel A. M. Davis has discussed (See *Medical News*, August 27, 1904) the question of disinfection of excreta in the field. He condemns burial and states that shallow burial is as bad as scattering it on the ground, but it is known that burial is always safe, providing it is immediately done. He states that disinfection before burial is inconvenient, never thorough, and but little better than burial. Boiling requires special apparatus such as the excellent one invented by Major H. A. Cummins and that is too heavy for any except permanent camps. Incineration is equally good but it also is a method for permanent camps where fuel is available. We can rest assured that though disinfection may be possible in permanent camps, it is not possible in the field and as it is only a makeshift for a sewer system which accomplishes immediate removal and water burial, it had better be considered a substitute and a poor one at that.

The sewage system so necessary for permanent camps requires a copious water supply, and this leads to the next point upon which there is well nigh universal ignorance in prevention of disease in the army. It is not generally known that health is not possible unless there are at least 125 or 150 gallons of water supplied daily per capita. Small communities, farmers and small bodies of troops depend upon the water of running streams which

are used as water supply and sewer combined. They never realize how much water they do use for bathing, laundry and other purposes, so that when camps are located where such open supplies are not available it is an invariable rule that water is insufficient in amount.

A bath is a necessity after a dusty day's march or drill. Experienced soldiers find ways of accomplishing this, but in the case of new regiments at permanent camps, bathing facilities must be provided or the soldiers are soon covered with vermin. In summer, a shed can be built in a few hours or canvass stretched, but for the colder months an enclosed shelter which can be warmed by camp stoves must be provided. A simple arrangement of perforated pipes is all that is needed for the shower baths, as immersion is wholly out of the question.

The location of a semi-permanent camp except where a copious water supply is available is therefore not to be tolerated. In camps to be occupied a few weeks, as in maneuvers, it is a question of multitude of wells and pumps prepared beforehand. The details for cleanliness of soldiers must be devised on the spot by the regimental or company officers. The water supply is a matter to be arranged by the officer in command of all the forces acting under the advice of his medical officers and quartermasters. We must remember that water costs something. The farmer's family of five spend money for pumps and wells. If there are 20,000 such groups in a city, the aggregate cost is enormous, yet it is cheaper than the cost to 20,000 farms. Likewise in a camp, it is absurd to reason that we can group 100,000 men in a mass and supply them with water without cost.

The danger of infected water has been forgotten since the investigations of 1898 exonerated the water supplies from the accusation of causing all the typhoid, yet bad water is a great danger, particularly in tropical campaigns. There is very little safe water in the Philippines except rain water and even that may be drained from dirty roofs. Much illness in the field results from the water though in garrisons it is possible to have it boiled or distilled. On the march, it is necessary that each company should have means of boiling it and the soldiers are to be severely

punished for drinking unboiled. One campaign in Mindinao was made during the cholera epidemic in a country where all the streams were infected and the natives were dying in large numbers. Not a soldier was infected, as the above means were strictly carried out even to the extent of compelling each soldier to carry two canteens.

With all our precautions we can never hope to crowd men into camps without danger of what we might call auto-infection of the army. It is a rule then, that regiments must be spread over as much ground as is practicable for administrative purposes. Latrines must be as far from the kitchen as possible and on the opposite side of the camp, but they cannot be at an inconvenient distance or it is an invitation to use the ground. A regimental concentration is necessary, but the distance between the regiments must be greater than we are accustomed to advise. The location of several army corps or even several divisions in a limited area is wholly inadmissible. It may have been necessary in the past, but now when telephonic communications are part of every field equipment and put up by the Signal Corps almost as soon as camp is made, there is no longer any excuse for the fatal crowding witnessed in late encampments. As a modern battle front of a half million men under one field marshal may extend four hundred miles, it is foolish to think there will ever be any necessity for cooping up one hundred thousand men in an area five miles square.

It must be made almost an axiom that temporary camps must never be used for a longer period than two weeks, and that, if at all practicable, the old camp site must not be used again by troops for a year. The British experience in the Boer war was disastrous from this fatal mistake of camping on ground recently occupied by other troops.

The necessity for good cooks in each company would not require a word, were it not for the fact that new organizations rarely attend to this matter. In the regular army the vicious system of general messes has been inaugurated but will be abandoned. As soon as a company takes the field it must depend upon itself, so that its apparatus and personnel must be ready. This

is impossible at present and the result is bad cooking just when the best is needed. An inspection of any latrine will show foods which have passed through the intestines unchanged. No greater reform is needed in the regular army and national guard than a system whereby each company is independent in its cooking arrangements, and at least every three months the full field equipment is taken out and used, the company thus subsisting as in field conditions. It is not generally known that field cooking, with its primitive appliances, is a special art which requires great skill and much practice.

Tropical experience shows that laundry arrangements are a military necessity on account of the skin diseases transmitted by infected clothing. National guardsmen go to camp with enough clothing to last until the end and have no conception of this necessity. In campaigns each man must shift for himself in the frequent moves and must wash his own clothes as occasion offers. In semi-permanent camps, particularly in the tropics, a company laundry is a necessity. It is a part of military administration and can be easily managed if the company commander is efficient. In permanent garrisons at home no attention need be given to the matter as there are always plenty of laundries near by, but it would be a good plan to compel company officers to attend to this matter even in such circumstances. There would be a more nearly perfect preparation for tropical service.

The difficulty of disposing of excreta safely in camps, explains the modern view of the spread of infections in the field—it is not so much a question of water carriage of the germs as it is the transfer of the bowel movements urine and sputum themselves indirectly from one man to another. Opinion is naturally divided as to whether flies are the main factors or whether it is the dust and dirt, inseparable from camp life, which carry the germs directly to the healthy. The point to enlarge upon is the fact that it is practically impossible to dispose of excreta so that it will not be carried to others. We have still another vital axiom for the future—that no sick man shall be allowed in camp. It has been proved that serious epidemics are spread by the cases retained in the crude field hospitals.

The whole basis of medical field administration is some arrangement of transportation by means of which the sick man can be at once taken from camp.

It is the duty of the medical department to organize three distinct classes of hospitals, which shall be definitely and positively regarded as serving different purposes. The first class consists of the general hospitals and this is the system which we now possess. The reader need not ask himself the question as to where he would like to be sent in case he contracts typhoid. It is already answered, for no one can think for a moment that such a case should be kept in the field. This was where we blundered in 1898. Upon the outbreak of the Spanish war, there was scarcely a physician in civil or military practice who did not believe that camps should take care of their own sick. The only differences of opinion were upon the point as to whether the regiment should do this duty, or whether the sick should be gathered into brigade or division hospitals. It is a complete revolution in thought that has taken place during the past few years, though there has been no real revolution in practice for it has been the invariable custom wherever possible to take serious cases out of camp and treat them in permanent hospitals.

It is as foolish to try to repair the broken down guns in camp as to repair the broken down men. All must be sent to permanent buildings in the rear as they require an equipment which cannot be carried into the field. The axiom of the field army is to get rid of the sick, yet the opinion is still wide-spread that they must stay with the army in camps. The only sick permitted in camp, are trivial non-infective cases, usually marked "sick in quarters" in garrison.

It is quite likely that at some period of every war, ten per cent of the forces will be in hospital and this should be the number of beds provided in general hospitals. The location of these hospitals must be convenient to railroads or ships which carry the patients from the field army. Their organization and equipment are permanent and must be as complete as any civil hospital.

It is a long way from the field army to a general hospital and transportation is intermittent not continuous. There must be hospitals more conveniently placed for the reception of the sick, and these constitute the second class on the lines of communication but sufficiently in the rear as to be practically fixed and in no danger of being suddenly evacuated. These are really base hospitals, yet they must be capable of easy removal. The equipment must be something in the nature of our present field hospital though simpler and more substantial so as to be easily set up in large buildings such as churches, warehouses, or in temporary pavilions, or even in tents, though the latter are not to be used except in rare emergency, for a tent is no place for the treatment of any sick except the tuberculous.

These hospitals must be within one day's travel from the front by rail and their location is a matter to be decided upon in each campaign by the Chief Surgeons. Here it will be possible either to treat cases until they are well or send them to the nearest base or general hospital as soon as crowding occurs or as soon as it is necessary to evacuate the hospital and move it up nearer to the army. Owing to the impossibility of easily moving a large equipment these hospitals cannot be designed to care for more than three per cent of the army, or 600 beds per division. It is evident that it is not practicable to have all the equipment constantly ready for shipment in time of peace, as the cost is prohibitive, but the details can be easily worked out, so that in time of war a telegram stating the number of beds needed at a certain point, would be followed by the shipment of the full equipment for the desired size of hospital, with tentage when necessary.

There is no appropriate name for this grade of hospital. We extemporized them in the Philippines under various names, some were in existence as long as three years before evacuation, others would outlive their usefulness in a few months or weeks. Perhaps it would be best to call them "Collecting" or "Temporary" to emphasize the fact that they are temporary places for holding and treating the sick until they can be sent to a permanent properly equipped hospital. They are necessarily under the control of the Commander of the forces in the field, who may place them

under the control of the subordinate general in the district they serve, as was found necessary in the Philippine campaigns when they were named "Brigade Hospitals."

These plans are mentioned for the sole purpose of calling attention again to the utmost necessity of removing the sick from camp to prevent infecting others and to secure better treatment than is possible in camp. The hospitals with the troops, constituting a third class, are mere emergency dispensaries for collecting and caring for the sick for the 24 or 48 hours needed to arrange for their transportation to the nearest collecting hospital. It would be best to call them "Ambulant Hospitals" for they are to be constantly ready to move on with the troops. They are the only hospitals in the world whose usefulness demands that they be kept empty. Their equipment must be extremely simple, for transportation can never be obtained in sufficient amounts.

The present regimental hospital is designed for an independent regiment with plenty of transportation, but no regiment of a large army can ever possibly secure enough wagons to carry it in an active campaign. The regiment must be ignored, as to hospital accommodations, and its equipment limited to a simple dispensary. It must contain some prepared foods and stimulants but an elaborate cooking outfit is inadmissible.

The present arrangement of four ambulant hospitals to a division—one for each brigade and one in reserve,—is best. They must have a fairly complete surgical equipment, yet we must disabuse our minds of the old idea that everything necessary in the way of surgery should be done on the battlefield in a place looking like a shambles. Experience shows that infinitely better results are obtained by applying temporary aseptic dressings and then shipping the men to the temporary or base hospitals or to their homes. The best surgical skill is needed where there is an appropriate equipment. Our present plan of giving operators high rank and sending them to the field where they cannot possibly use their abilities is the acme of absurdity.

The field or ambulant hospitals are really only first aid stations, all serious cases always being sent to the nearest collecting or base hospital. They might be provided with bed sacks, and

must have cooking utensils, but cots and like furniture are absolutely out of place. Our present equipment for these hospitals is really a collection of toys for fair weather in summer and would have to be abandoned before the first day's march from lack of transportation. The total capacity of these hospitals should be for two per cent of the command, or each of the four parts of a division hospital capable of sheltering and feeding about 100 patients. Each part would require four medical officers and 100 enlisted men, and the whole should be called the ambulance company.

As the patients may all be wounded men, it is evident that in a severe engagement the stream sent to the rear must begin at once for it is possible to have very much more than two per cent needing hospital care. It is also evident that the chief stores are dressings and foods. There must be abundant means of carrying water but everything bulky or heavy is to be omitted and the whole reduced to such a small mass that it can be loaded on four wagons. All such things as bacteriological, chemical and x-ray equipments are here out of place,—and it is even doubtful whether they should be tolerated in the temporary hospitals on the lines of communication. Their real place is in the base and general hospitals. Widal's test has no use in the field hospital either, because the medical officer should not retain in camp any case which has been sick long enough to react to this test.

The only logical conclusion to which we can arrive after this hasty review of a few of the modern essentials for the prevention of disease in an army, is the evident one, that to accomplish the one object of removing wounded or infectious cases from the camp or battlefield to where they will be properly treated or will not infect others, the medical department must have the means with which to do it. The prevalent idea as regards medical equipment is the curious one, that the surgeons shall have nothing except what is needed for the treatment of the sick in garrison and anything in the way of preparation for war is wasted money. The field and horse artillery should be placed on the same economical basis, if the argument is a correct one. All its horses should be turned into the Quartermaster's Depart-

ment to be loaned for an occasional drill, and then only when they can be spared from the carts and wagons in daily use at the post. It is no more necessary to train the horses for this special work than to train those for the city fire engines and ambulances. In the field, the artillery are generally occupied only a few hours in any campaign and it is an awful waste of public money to keep so many horses year after year for only a few hours' work in the next campaign.

This is the absurd type of argument used to check every move to equip the medical department with its own transportation.

If it is correct to equip the field artillery, so that it is always ready for war, then the same law applies to the field sanitary department. There should be one ambulance company or ambulant hospital for every 5,000 men in the Army, or a total of about twenty for our present Army at its maximum strength. They should be scattered throughout the country at convenient points and kept fully equipped, constantly trained and ready for the field at a moment's notice summer or winter. Each should have its ambulances, wagons, horses, harnesses, heating and cooking equipment, hospital material and personnel. The old plan of improvising this vital part of an army with heterogeneous materials, and then only after the force takes the field, should be discontinued.

Each ambulance company should include the simplified equipment which we have shown to be necessary for one fourth of the division field hospital, and the name "Field Hospital" should be abandoned. When a division is organized, four ambulance companies should be ordered to report to the division commander in the same way as the batteries. A separate brigade can take one company. A regiment has its own dispensary, but if detached it can take a section or one third of a company with the full surgical equipment of the company.

For this special service, medical officers will be compelled to specialize and stick to it. The artillery officers find that they cannot become expert in every branch of their service, and they are now advocating two services field and coast. How absurd to

expect a medical officer to become highly skilled in the management of an ambulance company after eight or ten years of practice, and then detach him and send him to a small post to do obstetric duties.

When war breaks out or troops take the field, the War Department, through the Surgeon General, at once organizes general hospitals for ten per cent of all the armies. The Chief Surgeon of the Troops in the field organizes "Temporary" or "Collecting" hospitals on the lines of communication for three per cent of the command, at places sufficiently removed from camp on a railroad or at a port, the equipment being collected at depots ready for shipment. The ambulance companies are the means of carrying the sick from the camp and are ready for work the minute they take the field. The regulations should be changed so that medical officers will be ordered to remove such cases at once to the collecting or temporary hospitals. Asepsis, as in surgery, is better than antiseptis.

The regimental outfit should consist mostly of dressings, simple remedies, prepared foods and a few simple instruments for emergency work, the whole packed on two or more mules in charge of a hospital corps private of the regimental personnel, the mules being later used to replenish first aid dressings and water during engagements. The tentage and baggage of the medical officers and hospital corps are placed on the headquarters wagons for neither ambulances nor wagons can be spared for a regiment. The expendable articles must be limited to a few weeks supply which can be easily renewed from the ambulance company. It must be sufficient to dress wounds of four per cent of the command, but if in any engagement there are more than this number wounded there will be plenty of time to send back for more supplies, for in such hard times it will never be possible to reach all the wounded in twenty-four or forty-eight hours.

Brigades will not be recognized as tactical units for medical administration. In camp or battle the division chief surgeon sees that one ambulance company is located so as to be convenient to each brigade, and as a rule placed under the temporary control of the brigade surgeon. Only in exceptional cases will it be possi-

ble to combine the four companies into one division field hospital, for the distances are usually too great. The brigade surgeon will be occupied in sanitary and medical inspections and in keeping his regimental officers in touch with his ambulance company. He is the link between the regimental first aid and the "Ambulant Hospitals." He has sole charge of the establishment of the ambulant stations to which the regimental surgeons must take their wounded from their dressing stations, the personnel and equipment being supplied by the ambulance company.

Part II.

THE PRINCIPLES OF ORGANIZATION.

It is not possible to go further into the details of field sanitation, but sufficient has been given to lead up to the main defect of military systems which has hitherto prevented the application of methods known to every military sanitarian. When an army is organized, it is impossible to obtain officers who know how to manage sanitation or indeed who know anything of its necessities. The Spanish war showed that the average volunteer and many a regular too, does not know the first principles of keeping a camp free of infections nor the dangers of fecal contamination. Anything the surgeon advises falls on deaf ears, and sanitation is sure to be left as before, in the hands of those who know the least about it.

It is generally conceded that when soldiers are sick, the surgeon shall do what his professional knowledge tells him is right and that no one shall interfere, but in the most important part of his professional duties—the prevention of that sickness—he shall be limited to recommendations. Unfortunately this is inevitable because the sick soldier is detached from his company, is sent far away and put under the military command of the medical officers, but the healthy soldier cannot be interfered with except by the line officer. Military necessity will always prevent full control of sanitary matters by the Medical Department. It is proper that it should be so, as it would not be an army otherwise.

Discussion of this point occasionally brings up the old accusation that medical officers are trying to command troops, and it is only mentioned to say that it is too puerile and absurd to deny. Medical officers have found out what line officers found out 3,000 years ago, that soldiers, whether healthy and in the ranks or sick and in hospital cannot be managed unless men of rank are over them. A hospital full of soldiers in charge of a civil physician, who may be looked upon as "Doc," is apt to be bedlam and the sick suffer for proper care, but a hospital in which orders come from the "Major" or the "Colonel" is easy to manage, and the sick receive infinitely better treatment. Medical officers demand military rank merely to be able to do their duty to the sick and for no other purpose. Recent experience with contract surgeons has shown the impossibility of using any other system. The Japanese are giving their medical officers high rank and are accomplishing results.

It is a fact which will exist forever that any expert specialists attached to the army for any purpose whatever, are advisers of the commanding officers, because no commander can possibly be an expert in all the arts needed in an army and must depend upon others. The officer who will not accept the expert opinions and recommendations given to him generally fails and is eliminated, but in the meantime there is disaster to the army. The story is told of an officer, newly arrived in Manila, who was ordered to attack a certain place. After he started he was informed by an officer who was acquainted with the ground, that he had better take another road and flank the position as his present course was dangerous. He remarked he would take no advice from any one, and like Braddock, he went to utter defeat and was killed.

The medical officer has usually been looked upon as an integral part of the command to receive orders like a company commander, but he must be considered in the more modern light as part of the commanding officer, acting for him in this sanitary sphere. It is said that during the Spanish War one General threatened a medical officer with court martial for calling attention to unsanitary matters. The surgeon is the only officer in

the army who, in the performance of his duty, must use extreme tact and weigh every word so as not to give offence. It is so difficult to do this at times that the average medical officer inclines to neglect a duty requiring aggressiveness rather than run the risk of being treated harshly. The most subordinate medical officers, who give the least disciplinary offence, can be the most worthless in rectifying glaring evils which are killing the soldiers. This is a dreadful possibility but it is true.

The aggressive medical officer must be protected if he tries to prevent such fatal errors as the camps of 1898. It can be done by a few words added to the regulations, and it would be best to do this before the people force it by a law which would be apt to go too far. The simple change needed is this: a written, sanitary recommendation shall be carried out if practicable, but if not practicable, the reasons must be endorsed on the report. Higher commanders, upon advice of their chief surgeons, must carefully investigate every sanitary recommendation which has been disapproved, and if it is really an impractical one, the surgeon shall be informed why, so as not to repeat it; but if the objections are not well founded the measures must be executed. It should never be possible again to block sanitation by simply endorsing on the recommendation the word "impractical."

There is also a natural and proper tendency on the part of higher officers, when there is a difference of opinion on the part of a medical officer and others, to support "the others," who are in the majority. The writer is aware of bad sanitary conditions thus perpetuated at the present time in army garrisons, which if allowed in the field or if they did result in publicity, would end in scandals similar to those of the camps of 1898. The present system demands that a surgeon be reprimanded for taking exception to his commanding officer's disapproval of sanitary recommendations as no subordinate can do this. His hands are tied, and they should be free.

There is a difference of opinion as to whether a sanitary report once disapproved should ever be repeated. Some surgeons think that it is best not to repeat, because the responsibility for disaster is shifted on other shoulders and that aggressive repeti-

tion of recommendations is bickering. They are wrong, for the medical officer is the guide, and if a guide sees the troops taking a wrong road through a misunderstanding and does not rectify the error, he is liable to be shot. It is a duty to repeat necessary recommendations, and the duty of those above to protect and encourage medical officers to do so.

These are the great faults of our present system which prevent correction of sanitary blunders. Subordination is necessary in an army—that is axiomatic—but if the army is so regulated that any of its officers cannot do their duty unless they are insubordinate, it is quite evident that the solidity of the organization is damaged. Efficiency and insubordination must be divorced. It must be so arranged that the most uncomfortable medical officers are those who neglect to be aggressive sanitarians, and the most comfortable are those who do their duty.

There is no body of men more vitally interested in the welfare of the soldier than line officers, and experience shows that they are fully alive to the matter and anxious to manage their organizations properly. It is generally ignorance of the necessity of a specific measure which is apt to lead them to the opinion that the sanitarian is a fussy enthusiast. This ignorance cannot be corrected without devoting so much time to the study that their legitimate work is neglected. Occasionally recommendations cannot be fully explained without writing a report which would resemble a treatise on hygiene, and they must be accepted on faith like the opinions of any other expert.

In order that there may be no doubt of the necessity of some change in the present system, which too often requires insubordination on the part of the medical officer if he is to prevent disease in an army, it has been necessary to give examples of present evils. The illustrations in this paper are given, then, in no carping spirit for they apply to but a very small percentage of officers, but they are mentioned merely to show the damage which may be inflicted upon an army by the rejection of sanitary advice simply because a responsible officer could not be shown its importance. In spite of these illustrations, it must be repeated that the attention given to sanitation by the great ma-

jority of officers is a matter of profound gratification; the fault is in a system which permits an unworthy few to sicken their forces, and thus do an injury to the nation which might be fatal to its welfare.

The course of civilization is always in the direction of specialization. When our ancestors were savages, there was so little knowledge that one man could know it all and he could be soldier, hunter and manufacturer. In time it was discovered that one man could do some things better than another and he devoted himself to special work, exchanging products with other specialists, and more was accomplished. This process of division of labor has gone to such an extreme and has caused such a tremendous increase of knowledge, that now a man cannot be an expert unless he limits himself to a very circumscribed specialty. The more complete the specialization, the greater is the daily product, so that nowadays a man's labor brings him more returns than ever before. A thousand men by division of labor may accomplish a thousand times more than an equal number without it.

This rule applies to military affairs also, for a modern army, in which there are expert specialists for everything, is infinitely superior to an equal sized army of savages all of whom are alike and who cannot specialize to produce that cohesion we call organization. When the nation was in its infancy, the President could be the Commander-in-Chief of the military and naval forces in fact as well as in name. In accordance with the evolution of ages the best commander of men naturally became the chief executive in every tribe or nation. It has practically worked out, that the Chief Executive in every nation now never commands in person but refers all such matters to professional soldiers. The Emperor William referred all to Von Moltke though all commands were issued in the Emperor's name, and this, the greatest of soldiers, never gave a command in his own name.

One defect of our military system was the absence of a General Staff of professional military men, each expert in his special sphere, which shall be the technical adviser of the President and yet do for him, and in his name those things which the Consti-

tution says he shall do, but which it was utterly impossible for him or any other one mind to do. It is along the line of this new evolution that we find the remedy for the defect in the present sanitary organization. We cannot educate the President to be an expert in all these special sciences of warfare, not even in strategy, and we must give him experts to act for him legally. We cannot educate the line officer to be a thorough sanitarian as he has too many other things to learn, and we must give him experts to act for him. Limitations of the duties of the general staff will prevent their violating the letter or spirit of the constitution, which makes the President the Commander-in-Chief, and limitations of the duties of the sanitary officers will prevent their violating the letter or spirit of responsibility for military command vested in the commanding officer. Each commander will be compelled by law and public opinion to use the special knowledge placed at his disposal and no more think of refusing to carry out suggestions of assistance than William dared to refuse to order what Von Moltke suggested. Here the analogy ceases.

Our Presidents have shown themselves to be so impressed with the overpowering responsibilities showered upon them in the full glare of the greatest publicity, that it is practically impossible for them to take action unless they know they are supported by the sound advice of experts. Far different is it in smaller military commands in out of the way places, where secrecy is the rule and where a young officer, not as wise as the Emperor, feels himself competent to manage all sanitation without advice and contrary to advice. While the President, upon the ground that it will render his command better, urged Congress to give him expert military advisers, to act for him legally, military officers resist any such plan in lesser sanitary matters upon the ground that it would interfere with military command.

There is a mania now attacking the army that all line officers should be carefully instructed in sanitation so as to become able to do the work themselves. The writer of this paragraph has spent over twenty years—the best part of his life—in studying this

one specialty and he is appalled at the large amount of it he still does not know. How absurd then to expect a line officer to become expert, when he spends the best years of his life in another specialty and despairs of learning all of that.

A little knowledge is a dangerous thing, such as in the case of an officer who, though densely ignorant of sanitation, questioned the expert opinions of a sanitarian by reason of an old diploma from a service school. A cavalry captain at a post where typhoid was prevalent, has been known to criticize the sanitary requirement to boil the water. He was an intelligent man but had just enough sanitary knowledge to be very dangerous, since he declared that the infection was spread by other means and considered it nonsense to take precaution with the water though the sanitarian had advised this measure. Wretched sanitation has been found in a post whose commander was quite expert on the breeding of flies and who believed that he knew more about the carrying of infection in this way than his medical officer. The most friction and worst orders to the surgeon came from a line officer who was a graduate veterinarian and who believed he knew more about medicine than his surgeon. In another case the surgeon reported that some low buildings built for storehouses but occupied by married soldiers were in a bad sanitary condition and dangerous to live in, being open to the weather, flooded with water in rains, and snow drifting in during winter storms. The commanding officer simply denied that they were in bad condition and that settled the matter. In another case, the surgeon reported barracks as overcrowded, and this was in the tropics where much more room is necessary than at home, yet this commanding officer denied it, on the ground that less room per man was needed in the tropics. In such a technical matter he considered that his opinion as a layman was better than the professional opinion of the specialist.

Another medical officer received orders from an officer, subsequently relieved of duty for incompetence, not to permit any patient in the hospital to do the least duty or work of any description. As the orders first stood, no matter how much they needed exercise, he could not order it, and no matter how much

dirt they wilfully made, a nurse would have to follow them around to clean up.

A line officer has reprimanded his surgeon for not giving quinine to the dengue patients, in spite of the fact that the surgeon had stated that quinine was worthless or even harmful in this disease. At another time he refused to permit the surgeon to give quinine to the whole company though most of them had estivo-autumnal organisms and were a great danger to the safety of the rest of the command.

A recent graduate of West Point denied the usefulness of mosquito bars and refused to order his soldiers to use them and within a few weeks he very nearly lost his own life from a sudden coma of pernicious malaria. He was spreading to all in the neighborhood, officers, soldiers and women, a most fatal form of infection and was too ignorant of the disease to know the seriousness of his criminal carelessness, and there was no way of compelling him to act upon the recommendation of the expert supplied by law. There was one Philippine post which was abandoned because the command was sick of malaria and it was subsequently found, that contrary to advice, the commanding officer had permitted the soldiers to sleep under the houses next to the ground, without mosquito bars. One scout company was worthless and collapsed from malaria, because its officers would not order the use of the mosquito bars the surgeon had advised.

When it is considered that all these officers had received considerable instruction in sanitation, it is evident that the system, which places in their hands the final decision of such important matters without responsibility or check of any description must be radically wrong. It is a system which, in the Spanish War, killed far more men than the enemy and the slaughter was wholly unnecessary. If it cannot be remedied we declare ourselves less capable than the Japanese.

The Navy has taken a step backwards by educating all its line officers in engineering duties so that they are all theoretically able to build, manage and repair the machinery. They stand appalled at the damage done, for in a few years our Navy will have no highly trained scientific engineers to do sea duty. They

have found out that the line officer has enough to learn without taking up engineering. After destroying that magnificent corps, and abolishing the finest Engineering School in the world, they are getting ready to drift back into the old system of a corps of engineering specialists in accordance with nature and modern civilization. The Navy has also thought that it could do the best ordnance work by detailing line officers for that duty, but it is reasoned that numerous mistakes are inducing them to organize a corps of specialists for this work as in the Army. We too have made our greatest blunder when Congress abolished the Army specialists so as to have nothing but line officers temporarily detailed in certain staff positions to do work requiring men of many years experience. It has already failed as it was natural it should, and it takes young men away from their special profession during the best years of their lives.

Medical journals are constantly publishing complaints about the inefficiency of the lay management of civil hospitals. The chief reason given is the manager's ignorance of the needs of the sick. It would seem strange if we would state that the cure for the defects of civil hospital management would be to teach the lay managers enough medicine and surgery to make them independent of the advice of the professional staff and yet that is exactly the present plan to improve military sanitation.

These courses of instruction for line officers are extremely dangerous, unless it is distinctly understood that they are designed for the sole purpose of impressing upon the young officer the importance of the matter, and that he will be acting foolishly if he ignores the sanitary recommendations he receives. If the instruction is to qualify line officers to be as competent as the surgeon and therefore independent of his advice, then to be logical each medical officer should be given a six weeks course in the technique of the arm of the service to which he is attached, so as to be fully competent to take command of any troop, battery, regiment or post as occasion may occur. The story is told of a hospital sergeant who, despairing of being able to pass his examination for promotion, preferred to take that for second lieutenant of the line and he received his commission. Is it a safe sys-

tem which makes him the judge of the correctness of a medical officer's expert opinions?

The whole course of civilization has been to restrict the scope of military command. There was a time when an officer had the power of life and death over his soldiers and could order the execution of anyone at any time, with or without evidence. In the centuries intervening, this has been toned down to a minimum in obedience to public opinion. In our Civil War the summary execution of treacherous guides was ordered by President Lincoln, but the present temper of the people indicates that even this is to be restricted. Every decade in civilization sees some change limiting the scope of command. The power to administer corporal punishment has been taken away only in the present century.

The last thing to be restricted is the power to destroy soldiers by avoidable sanitary blunders. Public opinion demands it and public opinion will win in the long run as it always does. The late Engineer-in-Chief of the Navy, Admiral Melville, in his last annual report, stated that all military reforms come from outside pressure. The very genius of military organization is extreme conservatism and reverence for precedent. Nothing new can possibly be permitted until prolonged experimentation shows it to be good. We hold to the old methods in use for centuries because they are survival of the fittest, and it happens that really useful reforms come from the outside pressure of public opinion. History shows that every important sanitary improvement in armies has been made in this way. Not only is this so, but every new sanitary idea meets with violent opposition until its necessity is recognized, when conservatism retains it. The inside pressure exerted by medical officers is unable to accomplish what the outside influence of public opinion attains, as we recently saw in the Panama Zone. Public opinion will abolish all sanitary evils eventually, but in the meantime there is a dangerous condition.

The French know that as long as their army neglects sanitation, it is harmless in a long war, and they are pegging away at innovations which will make it impossible for the army to destroy

itself. In the Senate in 1903 M. Cotteron is said to have announced that while the Germans had lost 13,000 soldiers from disease since 1870, the French lost 99,000. General Andrée acknowledged that their mortality was 4.17 per 10,000 as compared with Germany's 1.41, tuberculosis and typhoid being the chief factors, and he childishly tried to blame the civil authorities for furnishing bad water, and blamed the rules for recruiting. He concealed the fact that the rules were army rules and that they could have boiled the water. The fact is, the French nation is alarmed at its failure to increase in population, and when it has found out that the army has needlessly destroyed 76,000 of the best they had, it was naturally indignant at the men who have caused this slaughter through neglect of the rules of sanitation.

As compared with wars waged before we knew laws of sanitation the South African losses are not so bad after all, but English public opinion wants to know why the results were not infinitely better since we learned the causes of typhoid and how to avoid them. They rightly say that their sons whom they sent forth to battle for the country are entitled to all the protection of modern sanitation. They used harsh terms towards the War Office and every attempt to stifle enquiry increased the rage of the relatives of dead soldiers. It must change its methods soon in obedience to public opinion which states that if the soldier is to be killed, it shall be by the enemy and not by preventable disease. The sooner we face the music the better, for we must change our methods too, in compliance with our public opinion.

If military administration demands that the sanitarian can only advise, then neglect of that advice by an ignorant man, without military necessity, must be followed by his punishment if that neglect causes sickness or death of American soldiers. If the sanitarian is to be held responsible, he must be able to show that he has kept his Commanding Officer informed as to plans for remedying sanitary defects. At present, there is no punishment dealt out to either for these preventable deaths. In civil life where personal freedom is great, it is no man's business except his own, if he acquires an infection, nor is there any special complaint of such deaths, because it is the people's business and every-

one shares the responsibility. But when a man enlists, he surrenders almost all of his personal liberty. His life will be forfeited if there is neglect of sanitation on the part of those in authority over him.

These facts are being wielded by public opinion as proof that some one has been responsible for preventable deaths in recent wars—taking for granted that deaths are preventable. As before explained there is very much evidence that many we are fond of calling preventable are really non-preventable. For instance, deaths from malaria are inevitable in the field where we cannot protect from mosquitoes. On the other hand, in garrison, if the Commanding Officer refuses to take his surgeon's recommendation to compel his soldiers to use mosquito bars supplied by the War Department, it is evident that any soldier who dies of malaria at that post has probably perished unnecessarily, and at the hands of his own officers. This is the class of cases which the British public is trying to uncover and devise means of preventing, and the illustrations show that prevention is possible.

Formerly when the extent of the commanding officer's duties was unlimited, no regulation of them was needed. As it became evident that from the defects of judgment normal to every mind, restraint was necessary, more regulations were imposed to regulate command to make it more efficient. Several centuries ago they were mere orders of the King, but now the basic ones are enacted into fixed laws and constitute the "Articles of War," which are the fundamental law bearing the same relation to the varying regulations as the constitution bears to the ordinary more variable statutes. As civil communities grew in size, restraints on the citizens became more and more necessary, and they were gradually introduced in both the constitutions and statute laws which have thus become enormously complex. They do not take one jot or tittle from our freedom—we are free men just as free as ever,—but they make our freedom more secure. Law has but one object, the security of life, liberty and prosperity. Likewise military law has but one object, the betterment of military command—and the tremendous complexity of the regulations have had the effect of making modern armies

immeasurably more effective than those of a few centuries ago. If there were no foolish civilians, there would be no need of complex civil laws, because every man, being wise, would so conduct his own rights and liberties as not to injure the rights and liberty of others. If there were no foolish soldiers, there would be no need of complex military laws, because every soldier being wise, would so conduct his own office as not to injure his command.

A British Naval Officer, who was properly called "Gallows Jones," upon starting for the long and tedious trip to China and having no doctor, brought on deck the well stocked medicine chest which he said contained something good for every kind of complaint, and emptied all the bottles in one tub saying, "Now my lads, all the stuff is there, and there is bound to be something in it that will suit your complaint" (Fifty Years of Public Service, Major Arthur Griffiths). These were the good old days when there were very few of these "damned regulations" to protect sailors. In the same book Griffiths tells why his regiment in the Crimea which, in September numbered a thousand men, was reduced to but thirty in January. The colonel had the crazy idea of pitching the tents at the bottom of pits without drainage. This too was in the days when colonels were not bound down by so many regulations as now.

Before sanitary laws were known, medical officers were mere employees in the same class with wagoners and grocers. Disaster fell so frequently from having irresponsible and often rascally civilian contractors in these positions, that they are all now given military rank, the wagoners are now quartermasters and the grocers have become commissaries to the infinite betterment of the armies. Yet long after sanitation was known, the medical officers were not allowed to suggest changes. In the Crimean war, that great blot on English military history, they were bluntly told to hold their suggestions until asked for, and the preventable destruction of life went on. The war office was so helpless that they sent out a woman with supreme authority over doctors and line officers and she brought order out of chaos and made them all obey the sanitary laws which even common sense should have suggested. Since that time, the medical officers, in our

army at least are ordered to make suggestions, whether the line officers ask for them or not.

For a while commanding officers could simply pigeon-hole these vital suggestions, and so they had to be ordered by regulations to return them with objections, if any, endorsed thereon. That is as far as restrictions have progressed. If the commanding officer objects to having his men use mosquito bars and forbids it contrary to the advice of his surgeon, and some of his men are thus killed by pernicious malaria, nothing can be done about it until a further restriction on military command is made by a further addition to the laws and regulations. Like all other restrictions it will be to the advantage of the army; that is,—more soldiers will remain alive and well enough to fight when needed.

In the army as in civil life all kinds of schemes are invented to obstruct the sanitary innovations which progress makes necessary. For instance, one Commanding Officer, fearing to put himself on record, handed back a sanitary report and ordered the surgeon to make out a new one omitting a recommendation designed to stop the cases of heat exhaustion coming into hospital. Of course the surgeon refused to obey and of course he found the trouble which he expected,—trouble he would have avoided if he had neglected his plain duty and had obeyed the order.

When surgeons were mere employees, their status as aids or assistants to the commanding officer was not and could not be recognized. The constant trend of military evolution has been to subordinate their professional duties as personal attendants to the sick and make of them members of the staff or official family of the commanding officer, to help him manage his multifarious duties. They are now in this unfortunate transition period, still looked upon as under the military orders of the commanding officer in the same light as a captain is under the colonel of a regiment, and all suggestions are considered insubordinate in that sense. If there is a difference of opinion it is very easy to have the matter reach the stage where the surgeon is accused of disrespect, bickering, insubordination and what not. A young West Point graduate recently stated that in his opinion the sanitary reports of the surgeon, calling attention to defects in the command,

are criticisms of the commanding officer and to that extent in-subordinate even disrespectful. If this is true, then it will be necessary to make the surgeons independent of the particular troops with which they serve, and issue their orders from the next higher commander.*

The few abnormal minds who will reprimand the surgeon for repeating advice are as few and as dangerous as the abnormal commanders, like the drunken Braddock, who will reprimand a guide for repeating advice which would keep the command from ambush and destruction. There are enough of them left to make it necessary to regulate them, indeed, there are a few who pride themselves upon their neglect of sanitation. There was one field officer who boasted that he violated all sanitary rules in the Santiago campaign and did not propose to drink boiled water or do any other silly thing advised. He died of typhoid a few months after his arrival in the Philippines. The greatest percentage of death from cholera at any post was at one where the line officers would not boil the water, as they considered it unnecessary. In another instance an experienced colonel of infantry, while in Japan, smirkingly ate raw green vegetables immediately after he was told that they were badly infected with dysentery germs and were causing much sickness and death. He would not consider it necessary to prevent his soldiers doing likewise, and would no doubt destroy his regiment in time. In our Philippine campaigns many and many a tropical march has been made in the very heat of the day 11.00 A. M. to 4.00 P. M. when it was possible to march at other times, and much preventable

*It has been seriously proposed to make post hospitals independent of post commanders to avoid lay interference in professional matters and also to prevent the possibility of the sanitarian being brow-beaten into inefficiency—afraid to suggest improvements. The system works perfectly in the case of ordnance depots situated in army posts, and worked well in the Philippines where war necessitated its adoption here and there, and it must be adopted in time at home. The present system is a relic of a past age when surgeons were civilian employees, but it is now absolutely out of place. It presumes that a post hospital cannot be properly managed unless it be under the command of a line officer who knows nothing about the matter and who is liable to injure it by ignorant orders as I have seen more than once. Of course such a radical change will make the old conservatives gasp with astonishment, but they can give no good reason for a continuance of the present miserable arrangement. A commander merely wants his sick and wounded cured and returned to him as soon as possible, and if he cannot trust a medical officer to do this, then he is too suspicious of the efficiency of others to be tolerated in a modern army. We cannot expect a change very soon but that it must come in time no one can doubt. Hospitals must be taken from the control of those who know nothing about controlling them—common sense suggests that and military efficiency demands it now but it will require the disasters of war to effect the reform.

sickness resulted therefrom, some commands having fifty to seventy-five per cent. sick and all this was contrary to medical advice. At one post where there was an epidemic of typhoid from water infected by a case in a camp about two miles above the pumps, the officer responsible was very indignant because the surgeon declared the water infected.

Dr. Francis R. Packard (*University of Pennsylvania Medical Bulletin*, January, 1904) says that in 1775 "General Thomas who was in command of a division of the Northern Department of the Continental Army refused to have his troops inoculated for smallpox, because it put too many of their scanty number on the sick list. Smallpox, however, appeared among them, and they contracted the disease in the natural way, and soon his camp became a veritable pest-hole. As Washington Irving says:—General Thomas fell a victim to his own prohibition, on June 2, 1776, when he died of smallpox." If the officer who thus violates sanitary advice could only be the first one to die, the matter would rectify itself by the ordinary law of survival of the fittest, but he generally escapes and the soldier suffers.

It is often said that it will destroy military command if the advice of a subordinate must be carried out, nevertheless transports are managed by the navigating officer under the military command of the Quartermaster who is wholly inexperienced in navigation. Officers in command of escorts must consult the officer in charge of an expedition or reconnaissance. There are a number of things a Commanding Officer has to do if a soldier asks it in certain conditions.

Is it possible that any man can assert that General Thomas' command over his troops would have been injured by compelling him to observe sanitary laws? By his supreme independence he injured the cause of liberty at the very time when it could ill affect the least set-back, and it shows what we have so often said in this essay—the safety of the nation demands that in sanitary matters, all military officers, lay and medical, shall be bound down by more restrictions. This illustration is taken from a past century and cannot be repeated in this age owing to the orders compelling vaccination, nevertheless an Ohio volunteer colonel

did forbid vaccination in his command in 1898 (*Journal American Medical Association*, October 26, 1901) until he was overruled by higher authority, and there are many foolish men just like him who would ruin their commands were it not for orders compelling obedience to sanitary law. In 1903 there arrived in Manila an officer who had never been vaccinated, as he did not believe in it, and who somehow escaped the vaccination order before disembarkation. Within a few days he contracted smallpox and died of it, in the meantime exposing many others to the infection. These are clear illustrations of the rule, that the restrictions due to increasing organization bring greater efficiency by making it impossible for one mind by a slight vagary to do harm to the whole.

All over the world we are reducing to a minimum the danger of disaster from even a temporary lapse of one mind. By rules for the sea, railroad and business, it should be impossible for one man's mistake to ruin hundreds or even thousands. For instance we have the interlocking automatic switches preventing railroad collisions. It is now also practically impossible for a military force to be obliterated by one man's tactical blunders, there being too many checks of interlocking switches called field regulations. The only way we can obliterate it, is by a sanitary blunder for which there is no check. We are in the position of a community exposed to annihilation if it has a mayor who can, without responsibility for his acts, change its water supply from a good source to an infected one.

The military objection will cease when it is realized that by new conditions the sanitarian is really part and parcel of the commanding officer in keeping the command healthy. It is so short a time since the surgeon was an integral part of the command to be commanded like any other unit and of no use to the commanding officer except to cure the sick, that a few officers cannot appreciate the change which is taking place. They do not yet realize that the surgeon is already on the staff with the Adjutant, Quartermaster, Commissary, Signal Officer and Engineer loyal to his chief's real interests, with power of attorney in important matters. They still want to consider him a subordinate unit

having no status whatever as assistant to the commanding officer in his overwhelming duties, but one to order, to antagonize, to hamper with useless orders impossible of execution, taking away all initiative, considering it even insubordinate if he shows initiative, leaving nothing to his discretion, exacting blind obedience and regarding every exercise of judgment as disobedience. In this transition period of the present before Congress acts to make a new law, there must be disciplinary trouble and avoidable sickness.

In the whole history of the world there has been but one commanding general who was an expert sanitarian, and it was his rule to give *carte blanche* to the sanitarians on his staff and support them. The work accomplished by this system has elicited the admiration of the world. It was the result of the system which this paper advocates—the system now in successful operation in Panama, the system of utilizing instead of hampering the best workmen. It has done more—ininitely more—it has proved that loyal support to the sanitary adviser does not weaken military commands but strengthens them, and furthermore that since it is impossible that every officer can be educated to have an equally high opinion of the value of sanitation it proves that he must be compelled to obey its laws. As a century of vaccination has not convinced all of its value, and as we can keep armies free from smallpox only by a positive order to be vaccinated, we can rest assured that some non-medical officers never will be convinced of the value of new sanitary measures and must always be compelled by law to obey them. Further complexity of sanitary regulations is then a permanent necessity.

The medical officers themselves are not immaculate by any means. They sometimes agree with the officers who defy sanitation and the writer knows of one elderly surgeon who called a report vicious which had pointed out a serious sanitary defect. Some believe it to be the medical officer's chief duty to make himself agreeable, neglecting every duty which would disturb pleasant relations, no matter how much preventable illness results. There is no cohesion among the medical officers who, like physicians in general, have never been taught the necessity

for co-operation. Nothing can be done without organization, and in this respect they neglect one opportunity to do incalculable good to the army and the nation. Individual effort is feeble and apt to run counter to the work of another and accomplish nothing. They are human of course, and a certain percentage must be expected to be more interested in their own welfare than in that of the nation.

The great advantage of placing full responsibility upon the medical officers and punishing them for unsanitary conditions which cause camp diseases, is the great sobering effect it has upon them. Irresponsible men who merely advise are apt to be impractical. There never was a cross-roads lounge who did not give advice to the President, and the newspapers are full of letters from men who think they can run the universe. When a man is clothed with great authority and is compelled to act, he knows that the full responsibility rests on him and he becomes conservative at once. He does not dare to act unless sure he is right. The great fault of present sanitary recommendations is the fact that they are not of as high grade as they would be if the officer knew that they were to be at once executed and he himself held responsible. He would be slow and conservative, and the sanitary measures advised would be the best his brain could devise instead of insufficiently considered haphazard suggestions sometimes too radical for safe action.

Having expert sanitarians in the army, it is essential that no important undertaking involving sanitary matters should be designed without first obtaining expert sanitary advice. An honest attempt is made to do this of course as it would be idiotic to do otherwise, yet it is not obligatory by law and as a consequence minor matters are liable to be entered into without advice and unsanitary conditions created, such as crowding families into houses unfit for habitation as we have personally seen and have been unable to prevent or rectify. Let us keep in mind the most gigantic sanitary blunder on earth, the Chicago drainage canal—a civil blunder resulting from this very system. If there are any men on earth who know some sanitation it is the engineers and yet they have wasted nearly fifty millions of dollars of

the people's money to improve the water supply and now it is found out that they have not improved it a bit and never will by this canal. The *Journal of the American Medical Association* says: "It is probably safe to say that if the entire situation had been critically and carefully studied by a board of competent sanitary experts, with modern training in such matters, the construction of the present canal for drainage and sanitary purposes only would probably not have been recommended. But in the history of the present drainage canal, from its inception to its completion, the bacteriologist and scientific sanitarian is conspicuous by his absence." If we read the temper of public opinion correctly in Germany, France, England, the United States and Canada, it will insist that in every public undertaking affecting public health, whether it be military or civil, nothing shall be planned until the advice of trained sanitarians is first secured,—not the advice of surgeons, chemists or ophthalmologists but of sanitarians.

One of our general officers testified (page 3,080 of the report of the commission to investigate the war with Spain) that when he found out that reports of unsanitary water came from the "energetic medical fraternity" of the "alleged medical department" he did not bother further about it and drank of the water every time he passed the well. No wonder there were sick men in the camp, and no wonder the chief surgeon testified that the camp was "outrageously foul," and that it should be broken up at once. Another witness before the board testifies that in locating camps it was not considered necessary even to consult the surgeons—the Japs are said to think differently.

When deaths result from unsanitary conditions public opinion invariably holds the medical officer responsible. He has been blamed for every sanitary neglect in the Spanish War, even when his recommendations were not carried out. Public opinion must govern because it is the will of the sovereign who employs us, and it is merely a species of cowardice to shirk the responsibility. The moral coward is in the class with the guide who sees a command taking the wrong road which will lead to an ambush and does not at once renew his advice to take the other road. The

first recommendation may have been misunderstood. The medical officer then being universally held responsible, he wants to be so held as it is the only solution of the matter. He must be upheld when he is making the command more efficient, and it can be done without in the least interfering with the necessary military control by the commanding officer. We need pay no attention to those childish statements we occasionally hear, that the medical officers are trying to "run the army." The change desired is only one to keep us in accord with public opinion.

If the officer in command carries out a wrong recommendation, he is as free from blame as if he took the wrong road under the guidance of a defective map. If he refuses to carry out proper sanitary recommendations and he cannot show there was military necessity for disregarding them, he should be punished. His only duty is to judge whether the proposed sanitation will interfere with his military plans to sufficient degree to warrant disapproval. It is not his business to know why these recommendations are scientifically correct. The President is not required to know the why and wherefore of everything his general staff recommends. It is absurd then to suppose that every subordinate commander under the President is to understand everything his staff recommends from artillery fire to surgery, and War Department decisions definitely state so.

As a practical matter, most of the older officers of the army have become most excellent sanitarians. They are thoroughly conversant with modern discoveries and practical rules for avoiding disease. They have done what was never done before in the history of the world—carried on a campaign in a tropical country with 120,000 troops in the midst of epidemics of cholera, plague, smallpox, dysentery and pernicious malaria, with losses so small as to be astounding to the civilized world. Never before has such a thing been done without killing one-third to four-fifths of the soldiers or even all of them. If this does not deserve a monument in gratitude to the older non-medical officers as sanitarians, nothing does.

The point to be noticed is this, that when any of these experienced men is deprived of his medical officers to refer to, he

is lost, for he knows of their importance while the young officer does not. The greatest sanitary disaster came at a Philippine post where the sick and wounded had every professional care in an independent hospital. The only complaint heard was this,—“I have no medical officers under my orders,” though what use the medical officers could possibly be was not stated, unless as sanitary guides. He could have “ordered” any one else to do sanitary work. Already it has come to the point that a sanitarian must be with every command, yet to have irresponsible control over the health and lives of soldiers is intolerable in the twentieth century. We see the hand-writing on the wall and we wish to put our house in order, accept responsibility cheerfully, and conform to public opinion. When soldiers die unnecessarily we want full investigation and the guilty man punished. This cannot be done if we neglect the advice of sanitarians and give the line officers only a superficial smattering of sanitary science which makes him more dangerous than a brilliant commander who knows his own ignorance but who says to his surgeon, “Do whatever is needed and I will back you up later.”

The public is after the narrow man who says to his sanitarian, “I know better than you,” and who can say so with perfect impunity under present methods. They should particularly be after the few men who make a point of reversing the sanitarian’s actions, and “baiting” him into acts which can then be skillfully worked up into charges of insubordination, disrespect and disobedience. The use of these weapons by weak men can have no other effect than to damage discipline, paralyze all sanitary efforts, and injure the nation.

Note:—Since this essay was written, it has been reported that some of its suggestions were really forced upon both belligerents in Manchuria by the circumstances of modern war. It is regrettable, that an unwholesome conservatism will prevent their adoption in our army until we are forced to it by dreadful disasters in the next war. What is now too radical will become the practice by necessity but not until war shows the necessity. Men trained in the old system cannot see the need of a new one.

PRACTICAL METHODS FOR THE PURIFICATION OF DRINKING WATER.

BY BRIGADIER GENERAL WILLIAM H. DEVINE,
SURGEON GENERAL OF MASSACHUSETTS.

AS the name implies, this paper deals with practical methods for the purification of drinking water. The writer has had much experience in caring for the water supply at militia encampments, and the subject as treated here will apply only to the care of the water supply at military camps.

Distillation, boiling, chemical disinfection and other means of purification will be considered. You will all agree that the most important disease, numerically considered, to be contended with in army life is typhoid fever. This paper does not attempt to enumerate the various ways in which typhoid is spread, except to emphasize the fact that the origin of most epidemics is the water supply. According to the medical press, the recent epidemics in Chicago, Brooklyn, Philadelphia, New York, Springfield and other cities have all been attributed to impure water. While the means of preventing the pollution of water supplies do not come within the scope of this paper, still all will realize that it is as important a consideration as the purification of water that has already been contaminated. Doubtless, too, the pollution of many forms of food has its origin in water. An example is milk, which probably in many cases receives the bacilli of typhoid from the water which is added to thin it.

Other diseases which have been caused by the ingestion of impure water are diarrhoea, dyspepsia, metallic poisoning and entozoa (the embryos or eggs of the tapeworm having been found in drinking water). At encampments in this country we have to deal principally with diarrhoea and typhoid, and by taking the proper steps to prevent these diseases we shall prevent also other ailments which come from polluted water. There is more opportunity for water to become contaminated than any other liquid,

not excepting milk. Its careless handling, even if it be pure at its source, may pollute with typhoid and other germs. Milk is generally carried in stoppered vessels and is not apt to be consumed by different persons from the same drinking vessels, which of course is a common practice in regard to water.

The principal methods for the purification of drinking water are the following:

- (1) Distillation,
- (2) Filtration,
- (3) Chemical disinfection, and
- (4) Boiling,

and they will be considered in that order.

(1) Distillation, while an ideal method, has this disadvantage: The necessary apparatus is expensive, bulky and complicated. Consequently, while perhaps it could be recommended for the army in the field, it is hardly practicable for the National Guard.*

(2) Filtration. It is difficult to place any confidence in domestic filters for camp use, for the reason that so much depends on scrupulous care that, if the filters be neglected, the pores become clogged with organic matter, which soon becomes the nucleus for the growth of the living organisms that contaminated water contains. No less an authority than Parkes says: "Domestic filters are more often a source of pollution of the water than otherwise." Of course this does not apply to the *filtration of water on a large scale*, such as large municipal plants.

(3) Chemical disinfection. Many chemical agents have been recommended for the sterilization of water, as alum, hydrogen peroxide, copper chloride, acids—such as tartaric, citric and acetic acids—iodine, chlorine gas, chloride of lime, ozone, sodium bisulphate and bromine.

Alum has long been used as a purifying agent. When added to water containing chalk in solution, it forms a bulky

*Since writing this article it has been learned from the Quartermaster's Department, United States Army, that the Forbes sterilizer, used by the United States Army, is comparatively inexpensive. It has a capacity of 25 gallons per hour, and consumes one-fifth of a gallon of mineral oil per hour, 150 degrees fire test. Four sterilizers should, therefore, be sufficient for a regiment of 750 men, the water to be distributed to the companies by carts.

precipitate of aluminum hydrate, which falls to the bottom of the vessel, carrying with it any suspended or floating matter; but it has little or no effect on organic matter in solution in the water. About one grain of alum to one gallon of water is the proper proportion. While this method clears the water and purifies it to some extent, it is evident that it could not be relied on to destroy all germs and completely sterilize all water.

Water unfitted for use by the presence of organic matter has been sometimes rendered usable by infusing certain vegetable astringents in it. In certain parts of China, where the water contains a large quantity of organic matter, the inhabitants drink water only in the form of tea. The tannin of the tea-leaves precipitates the suspended matter, and renders the water fit for use. Mixing the water with astringent red wine is said to have the same effect. No doubt much of the reputation attaching to coffee as a beverage in army life comes from the fact that the water is sterilized in the process of preparing it.

The study in detail of the many different chemical agents would take too much time and space in this paper. However, the writer would recommend to medical officers further study along this line, as it may offer in the future a solution of the problem. Munson's *Military Hygiene*, Caldwell's *Military Hygiene*, Parkes' *Practical Hygiene*, Harrington's *Hygiene*, Rohé and other well known authorities may be consulted with profit. In the writer's opinion, however, but few methods of chemical disinfection can be approved at the present time, especially for military purposes, on account of time required.

(4) Boiling is the most practical method of purification, especially at military encampments. There is no doubt that the specific poisons of typhoid and other diseases found in drinking water are destroyed by boiling. To destroy these germs completely it is necessary to boil the water; that is, to raise the liquid to a temperature of 212° F., and it is well to keep it at that temperature for several minutes at least.

The necessity for some simple method like boiling was brought home forcibly to the writer when he was medical director of the Second Brigade of the Massachusetts Volunteer Militia in

the summer of 1900, when his examination of the conditions surrounding the water supply at the camp showed that the pond which furnished the water was in close proximity to sources of pollution. The danger that such an emergency as this will arise makes it extremely advisable, in fact necessary, that medical officers shall be acquainted with a method of purification whose greatest virtue is simplicity and practicability. No method combines these two qualities like boiling.

In the case referred to, instead of waiting until sickness was caused by the ingestion of the polluted water, the writer urged the brigade commander to issue orders requiring all drinking water to be boiled; not only to prevent a possible epidemic then and there, but also to educate officers against the contingency of future active service. The method recommended by the writer then was that two men be detailed from each company to take charge of the purification, cooling and dispensing of the water for the use of the company.

At a meeting of the medical officers of the brigade before that encampment the writer impressed on them the importance of carrying out instructions, and while he expressed his own ideas as to the kind of apparatus to be used, he encouraged them to follow their own good judgement and try to evolve some practical methods for themselves. Nor was he disappointed, for many schemes for boiling were devised by different officers, some of which will be described. As shown then, the simplest method is to use ordinary cooking utensils, such as pots and wash-boilers. But while these will serve in emergencies, there should be some definite system,—some special apparatus for such an important work.

The following is quoted from the writer's report of his tour of duty for that year:

The experiment of using boiled water for drinking purposes at camp was a success. Considerable ingenuity was displayed in the methods for boiling, cooling and dispensing water; but the method of Captain James Cully is deserving of special mention, and is an efficient and practical method for a militia camp. With some modifications of apparatus to make it more durable, it would be suitable for campaign purposes. This officer had all drinking

water for his company boiled in the cook-houses in large kitchen boilers. After boiling, the water was transferred to a 10-gallon stone jar, which was placed in a large whiskey cask and sur-

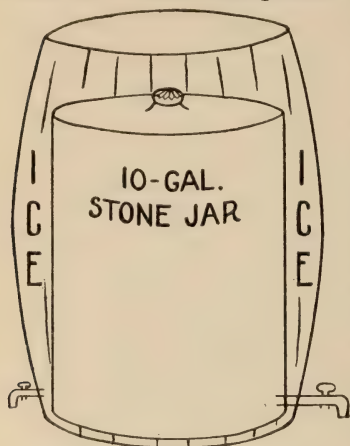


Fig. 1.—Diagram of Captain Cully's Arrangement.

rounded with ice. Water was drawn from the jar by a self-closing faucet and waste ice-water by another faucet. This water-cooling apparatus was placed in a tent in the middle of the company street and the tent was designated "the water tent." Two men were detailed each day to look after the boiling and care of the water, and every man was ordered to drink from his own dipper. The water when cooled was very palatable. The officer in question stated that the men drank freely of the water and were very thankful for such a good supply so near at hand.

A second method, as described more fully in Circular No. 2, Surgeon General's Office, M. V. M., current series, was shown at a meeting of the medical officers of Massachusetts called by the writer last March, by Lieutenant Cummin. It consists of three tanks nested into each other, which is possible because of the gradation in the sizes, and which thus saves a great deal of space in transportation. Their various maximum capacities are twenty, sixteen and ten gallons, and each is provided with a cover, which it is suggested could be padlocked. When one tankful has been boiled it drains off through a standard-size detachable faucet into one of the other two, which is then covered and set apart for cooling.

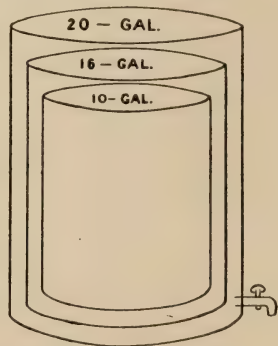


Fig. 2.—Diagram of Lieutenant Cummin's Arrangement.

The writer commends either of the above methods. The first apparatus, made of tin, instead of cask and stone jar, is suitable

for field purposes. He would suggest also for the consideration of medical officers the ordinary wash-boiler walled off into two unequal compartments, the smaller one for ice and the larger for the boiled water, both compartments to be provided with faucets, and the cover to the whole to be hinged and padlocked. (See Diagrams Nos. 3 and 4).

It seems needless to say that, whatever apparatus, is used, the ice should never be added to the boiled water, unless it is artificial ice, and also that the water should always be taken through the faucet provided for the purpose, as the dipping of drinking vessels into the supply itself would nullify the precautions taken in boiling. The vessel containing the boiled water should be elevated.

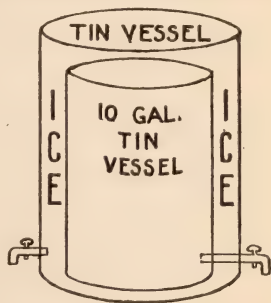


Fig. 3.—Diagram of Water Sterilizer Made of Tin.

If boiled water is very cool it is quite palatable, and of course aeration adds to its palatability. The simplest method of aeration is to pass the water from one sterile vessel to another. Allowing it to drip from one vessel to another is easy and efficacious. Water may also be aerated by passing it in fine streams through holes in the bottom of a vessel, elevated to allow the water to pass through a considerable stratum of air.

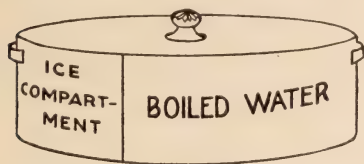


Fig. 4.—Common Wash Boiler, Walled Off.

A medical officer must have the courage to condemn water when he knows that it is impure. He must also recommend that water be not used unless analysis or its previous continued use

by the community attests its purity. In one case the writer caused great inconvenience to troops by refusing to allow water from wells to be used until samples from it had been analyzed. At that camp it had been planned to get the water from artesian wells, but at the last moment that plan had to be given up; and so the securing of drinking water from some old wells, witho

any attempt at purification, was contemplated, necessitating the writer's prohibition until he was satisfied of the water's purity.

Medical officers should always ascertain the health of the district in the vicinity of the camp, which can be done by communicating with the health authorities in the vicinity. When Medical Director of the Second Brigade, M. V. M., the writer always communicated with the proper Board of Health, as well as with the State Board of Health.

It is not the writer's purpose to recommend any special form of apparatus for the purification of drinking water, but it is his belief that every military organization should be provided with means outside of cooking vessels to furnish boiled water, when there is any doubt of the condition of the available drinking water. But these vessels should be relied on in an emergency. And the reason for these suggestions is that while an emergency apparatus for the purification of water can be improvised quickly, still there is danger of pollution in the short interval while it is being improvised. The danger of pollution should be reduced to a minimum.

This whole matter has always seemed so urgent to the writer that the first thing he did after becoming Surgeon General of Massachusetts was to get the Secretary of the Massachusetts State Board of Health, an authority on the subject, to address the medical officers of the entire state on the "Choice, Examination and Protection of Water Supplies for Military Camps."

Before summing up the points of this paper, let it be emphasized here that theory and practice should go hand in hand, especially in military medicine. The medical officer should always apply the theories which he expounds for the prevention of disease. There is too much theory in this regard and too little practice.

And the principal points which he wishes his hearers to carry away with them from this meeting are these:

(a) That in military life the main source of typhoid is the water supply;

(b) That by simple inexpensive methods water, even if polluted, can be rendered safe for drinking;

(c) That boiling is as good a method of purification as can be desired;

(d) That boiling is the most practical method of purification;

(e) That a durable, inexpensive apparatus for boiling water should always be on hand;

(f) That a definite system should be devised and some simple apparatus should be a part of every company's outfit;

(g) That every care should be taken to prevent contamination after purification; and

(h) That the whole matter is of such importance that a special detail should be organized in every command to take charge of the purification of the water.

And in closing it is well to remember always that the National Guardsmen are the citizens of the future, and that an intelligent interest excited in them in the subject of pure drinking water will do much to educate the whole people along that line. If the writer can impress these few points on the medical officers here present and thereby always have the different commands prepared to purify all contaminated water before being used, and to take such precautions with water that is not proven to be pure, he will feel that this paper has justified itself.

LAPAROTOMY IN THE FIELD.

DURING the last summer drills of the Norwegian jaegerkorps a soldier fell, says Lieutenant Arentz (*Norsk tidsskrift for militar medicin*), and spitted himself on a lath which penetrated from the scrotum into the abdomen. Laparotomy under primitive conditions permitted the removal of a wedge-shaped piece, twenty-three centimeters long and about two and one-half centimeters broad, of rough lath. Immediately after the operation the patient was seized with a chill followed by pneumonia, and after that with gangrene of the lung. Two months later he coughed up a small splinter of wood. The lath consequently had perforated the diaphragm and penetrated into the lung. The patient recovered.—HANS DAAE.

TRANSPORT MODEL FOR CONVEYING RECUMBENT WOUNDED OVER ROUGH AND MOUNTAIN- OUS ROADS.

BY DOCTOR ALEJANDRO ROSS,

PHYSICIAN AND SURGEON OF THE MEXICAN MEDICAL FACULTY,
LIEUTENANT COLONEL SURGEON OF THE ARMY; PROFESSOR
BY COMPETITION, OF THE CLASS OF TRANSPORT AND TREAT-
MENT OF SICK AND WOUNDED ON THE BATTLEFIELD AT THE
PRACTICAL MEDICO-MILITARY SCHOOL; PROFESSOR AT THE
AGRICULTURAL AND VETERINARY NATIONAL SCHOOL OF
THE CLASS OF HYGIENE; LIEUTENANT COLONEL CHIEF OF
"DETAIL," IN THE MILITARY INSTRUCTION HOSPITAL OF
MEXICO; FORMERLY SURGEON OF MEXICAN NAVY AND DELE-
GATED BY THE SUPREME GOVERNMENT OF THE MEXICAN
REPUBLIC, AS A REPRESENTATIVE OF THE MILITARY MEDICAL
CORPS AT THE FOURTEENTH ANNUAL MEETING OF THE ASSO-
CIATION OF MILITARY SURGEONS OF THE UNITED STATES.

I HAVE been highly honored by the Supreme Government of Mexico, which has elected me to represent the Mexican Military Corporation at the fourteenth annual meeting of Military Surgeons of the United States.

I truly regret not possessing fluently the beautiful English language, in order to address the honorable Association here assembled; but confiding in your benevolence I trust you will overlook the faults I may make in speaking, as this is a difficulty we all have in trying to express ourselves in a foreign language.

In addressing this learned body I would like to call your attention to the growing development of the different branches of human sciences cultivated in the Republic of Mexico, under the patronage of the patriotic Government, at the head of which we have a great man whose name is universally known, General Porfirio Diaz.

Now I am going to study a subject which I believe to be of great importance to all Military Surgeons.

One of the greatest difficulties which a Military Surgeon meets with, in order to transport the wounded over mountainous roads, is the lack of a proper vehicle in which the wounded will not suffer, and in which he may be carried long distances without causing his wounds to grow worse. It is well to know that an inappropriate means of transportation may cause a very small wound to become truly dangerous, and may even rob the life of a patient when there were many hopes of saving him.

The mountainous roads are narrow, accidented and of difficult ascent, and if they prove even of great danger to the man who



Mexican Transport Model for Carrying Wounded over Mountainous Roads.

travels these paths on foot or on horseback, what will happen to the poor wounded who have to be carried in a horizontal position? We can easily imagine the great sufferings to be endured by the patient and the difficulties to be overcome by the Surgeon in order to lessen the patient's sufferings and to make the journey as endurable as possible.

In the mountains of Guerrero, I have had the opportunity of witnessing the condition of a soldier who belonged to the 21st Battalion who had been shot in the left knee, receiving a severe

wound, complicated with suppurated traumatic arthritis. As a means of transport we chose the litter which I present to-day, and which was previously cushioned and in which the wounded soldier was placed.

The distance was forty-two miles which we made with but a single interruption of two hours.

We asked the patient if he suffered during the journey to which he replied, his sufferings were no worse than when we started and that he thought the vehicle quite comfortable.

He suffered no accident during the journey and I must call your attention to the fact, that the said wound was a serious one which had been suppurated for twenty-four days.

When we came to a level road we put him in a wagon in order to continue the journey and the patient himself assured us that he was more comfortable in the litter.

The litter is made of a wooden box one meter sixty centimeters long, one meter wide and forty centimeters high, having six posts which sustained an awning and several curtains, by use of which one can entirely close the litter. This box rests upon two horizontal shafts which are far enough apart to hitch a mule both in front and behind.

The patient within the litter is well sheltered and protected from the rain, sun, and the cold.

Let us now note the movements that this vehicle is subject to during the march: In traversing the rugged roads, I noticed that the litter which I have just described, presented two different kinds of movement; the first was a continual lateral oscillation which was due to the gait of the mules, the second one was owing to the inclination of the road, for the litter changes its level, it is only when on a level road that it maintains its horizontal position. There is also a third, but less frequent movement, such as passing a ditch, the mule in front will go over the ditch without any hesitation, but the mule behind will stop, this produces a sudden jerk which is very trying to the patient. With the exception of this last movement, the former ones can be borne with but little inconvenience.

Well then, if we consider the means of transporting the re-

cumbent wounded which have been put into practice in the mountainous roads that will not permit the passage of a wheeled vehicle, I will fix my attention principally upon two: the stretcher and the litter, and as the first requires numerous and strong attendants and are forced to make short journeys, I would prefer the latter which requires but few attendants; a single guide and two mules being quite sufficient to traverse distances more or less great.

Believing that the litter which I have just described, may be of great service in the mountainous roads and perhaps with a few modifications in order to lessen the oscillations and thereby diminish the sufferings of the wounded, it would be a very useful means of transporting the wounded in a horizontal position and should be counted among the vehicles which the Ambulances have at their disposal.

In closing, I should say that the vehicle already described is in use in the southern part of Mexico in the mountainous country and that many people make use of this as a means of conveyance.

ROENTGEN RAYS IN MILITARY SURGERY.

IN a recent article, Surgeon C. F. Stokes, U.S.N., has described a few types of wounds that military surgeons are confronted with, and how important the Roentgen ray has become in military surgery in both the army and navy. He estimates that about ninety per cent of the casualties are caused by wounds from shell fragments and splinters in naval warfare. All of the army hospitals are now completely equipped with x-ray apparatuses. Most of the larger hospitals have an apparatus, modeled according to plans devised by the author. It is mounted on a steel truck, with rubber wheels, is easily moved, and can be used in lecture rooms, wards, or laboratories, as occasion demands. The problem of weight has always been the stumbling block in connection with the portability of these apparatuses, for use during hostilities. Storage batteries gave great satisfaction during the outbreaks in South Africa. The French have experimented with a radiograph motor wagon which has given some satisfaction and promise for the future.—*Archives of Physiological Therapy.*

A MUCH NEEDED AND EASILY EFFECTED REFORM IN CAMP SANITATION.

BY NORMAN ROBERTS, M.D.

ASSISTANT SURGEON IN THE PUBLIC HEALTH AND MARINE
HOSPITAL SERVICE.

WHEN a large number of human beings are assembled and kept together for a number of days or weeks, the disposal of their excreta becomes at once a matter of life-and-death importance. When the assemblage comes together under such circumstances that elaborate provisions can be made, the installation of a good water-carriage sewerage system at once and with entire satisfaction solves the problem; but in most military or detention camps no such elaboration is feasible, and means more primitive must be resorted to. Of these means the most generally useful is the "sink," a simple open trench in which are received the urine and feces, the final disposition of which is burial by throwing back the dirt dug out from the trench, when it is considered that a safe maximum of the excreta has accumulated. The obvious defects of this system as it is usually *mis*managed, and the appalling amount of sickness and death that it has caused, have led to the trial of many substitutes, all more or less effective in reducing the sickness, but so expensive, clumsy, and generally inapplicable to conditions of active military or epidemic service that the sink, in spite of all its drawbacks, still remains as practically the only means of disposal of camp excreta.

The sink has the great advantage that it can be constructed by the ubiquitous unskilled laborer with no other tools than the ever present pick and shovel and with no expenditure of purchased and transported material; whereas all other systems require the outlay of more or less of purchase-money, transportation, and skilled labor. The disadvantages of the sink are the foul odors, the filth-smeared flies, and the murderous typhoid. For

some reason the average camp sanitarian has concluded that these drawbacks are inseparable from and essential to the sink, and accordingly has either allowed his charges to suffer and die from the results of the nuisance unmitigated, or has discarded the sink and wasted money and experience on impossible incinerators, can, tank or trough systems, and other complicated devices; being forced, when active service comes, to discard them all and fall back on the sink in its original unmitigated nastiness and deadliness.

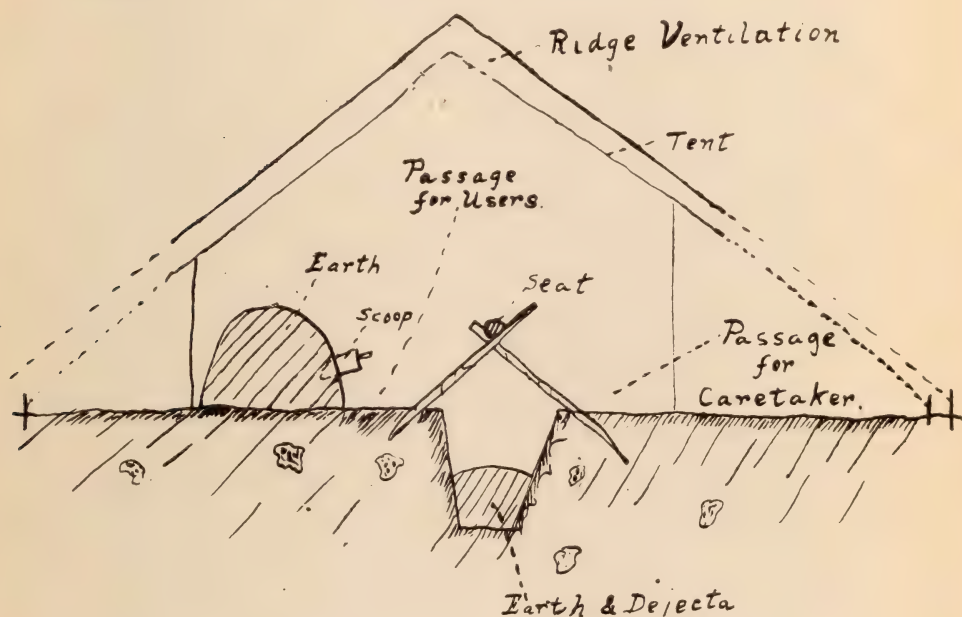


Fig. 1. Combined Earth Closet and Sink.

It is obvious that the essential objection to the sink is the exposure of large quantities of fecal matter to the air and to flies, in the near neighborhood of eating and sleeping places. Prevent this exposure, and the sink becomes the most sanitary, as well as the cheapest and simplest mode of disposing of camp excreta. The most effective and practical way of preventing this exposure is to cover the dejecta, immediately after they are drop-

ped, with a liberal quantity of the earth taken out to form the trench. The flies are shut away, the odors are smothered, and the nitrifying bacteria in the soil make short work of the feces themselves. This plan of prompt burial of excreta is not new. It was enjoined on the children of Israel during their journey up out of Egypt, it has given satisfaction wherever properly employed, and it is mentioned and praised in the principal works on military hygiene; yet the most prominent American writer devotes but a few lines to it, as against several pages to the discussion of practically useless mechanical contrivances, and in prac-

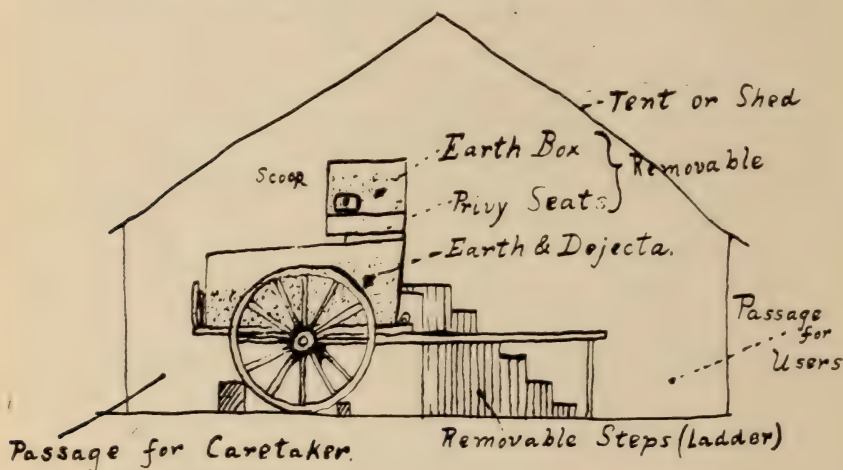


Fig. 2. Cart Earth Closet. Sectional View.

tice it seems to be altogether ignored. In the great majority of cases it is far superior in every important respect to any collection system requiring manual labor or a mechanical excavator as an accessory, or to any incinerator, clumsy and expensive. The only assignable real reason for the general neglect of this simple and efficacious plan seems to be the perversity of human nature, which objects to a simple plan when a complicated one can be substituted, and which considers such a subject as the disposal of excreta to be beneath its notice anyhow. The argument that extra work is required to dig trenches on account of the more

rapid filling up, is unworthy of notice in view of the great good to be obtained; and the need for extra work is more apparent than real, in many cases.

The details of construction may and indeed must be varied according to circumstances. One fairly good plan (Fig. 1) would be to dig the trench, throw the earth some distance to one side (leaving a passageway between the ditch and the pile of earth), put up a stout railing over the ditch to serve as a support, and cover the whole with a tent (preferably fly proof) or a canvas roof.

Several improvised scoops should be left in the pile of earth, and a sentry stationed *constantly* inside the tent (at least during the day, with frequent visits at night) to enforce proper use of the earth—not really a disagreeable duty, if it is well performed. A medical officer

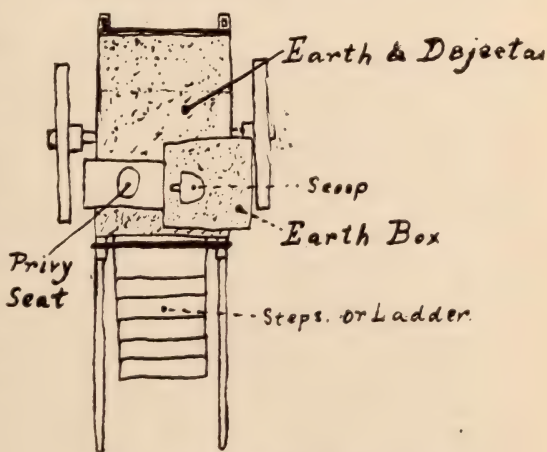


Fig. 3. Cart Earth Closet—from above.

should frequently inspect the sinks to see that the users and the sentry are properly caring for it.

The one real disadvantage of this dry-earth sink is, that it is not fool-proof. Given a camp sanitarian or a commanding officer too stingy, too lazy, or too disdainful to spend on the system the necessary labor and supervision; or given a body of raw recruits or refugees too filthy and undisciplined to obey the necessary orders—and this “improved” sink becomes at once no improvement over the old fashioned cesspool.

This combination of the dry-earth and the sink systems, when properly managed, fulfills all essential requirements in perhaps the majority of cases of temporary camps. It can be sup-

plemented by urinals consisting of portable boxes (or preferably wheelbarrows of dry earth, renewed every twenty-four hours and placed in the company streets during the night. In camps badly infected with typhoid and dysentery, it might be better to replace the sinks by a system of extemporized dry-earth closets (Figs. 2 and 3) made of ordinary dump carts partly filled with earth and placed in rows under a suitable shelter, the excreta being finally disposed of by simply hitching a horse to each cart as it becomes

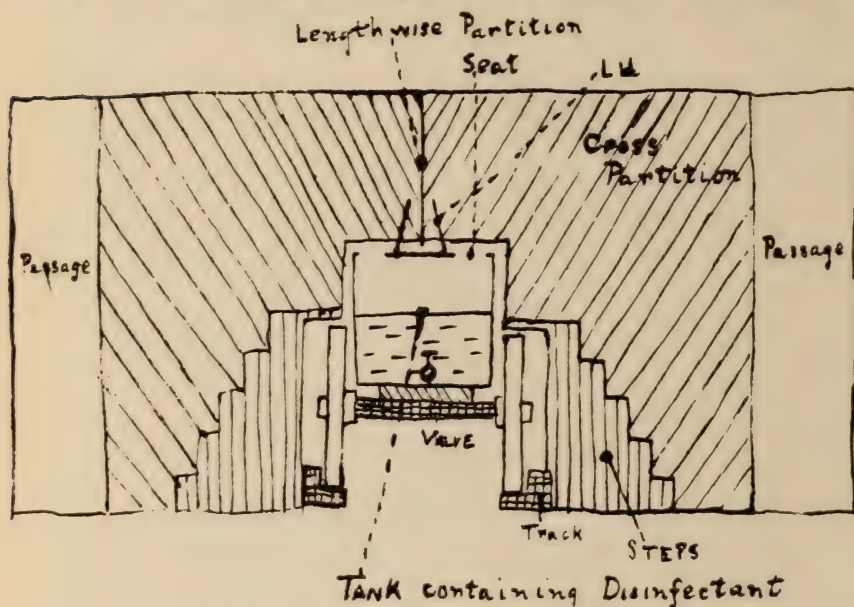


Fig. 4. Tank Disinfecting Closet—Sectional view.

filled, and dumping the contents at a safe place some distance from the camp.

In cases where strong chemical disinfection of the dejecta is deemed necessary, as in cholera camps, covered tank wagons partly filled with the disinfectant should be provided with privy seats on the top, and the feces and urine passed directly into the disinfectant (Figs. 4 and 5). The wagon should in this case also be under shelter, and in both cases suitable steps and stagings should be improvised for the convenience of the users.

The essential point in any good system of disposal of excreta

is, that the dejecta are passed *directly* into the agent that makes them harmless, and under such circumstances that the need for manual labor or complicated special apparatus in their subsequent disposal is cut down to next to nothing. (Postulate).

It is a matter for regret that soldiers and even sanitary officers are so afflicted by false pride as to consider themselves insulted by any detail connected with the disposal of dejecta. Munson reports that it is necessary at certain army posts to obtain civilian labor to take care of the cleanly earth-closet systems. So

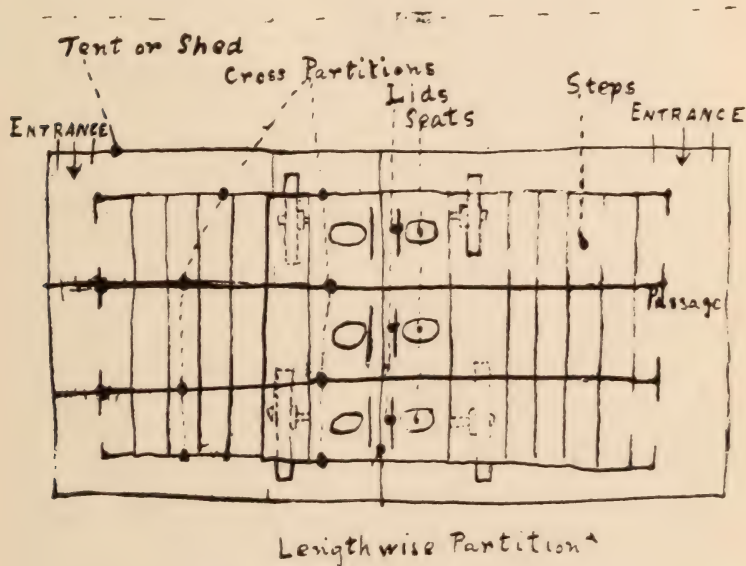


Fig. 5. Tank Closet in Diagram.

long as this spirit persists, so long will this vitally important work be slighted, and so long will the disgraceful record of preventable sickness and death continue. Success in preventing sickness and death by any means whatsoever, should be a matter for pride on the part of the sanitarian himself and for honor from his associates and the public. And one of the most important features of a healthy camp is a sink odorless and flyless, and presenting instead of the usual disgusting spectacle of dead and rotten filth made alive by buzzing and crawling vermin, only a fresh surface of clean, wholesome earth.

SOME PHYSICAL EFFECTS OF GUN FIRE

By FLEET SURGEON LLOYD THOMAS, R. N.,

SENIOR MEDICAL OFFICER H.M.S. "EXCELLENT;" NAVAL
GUNNERY SCHOOL, PORTSMOUTH, ENG.; MEMBER OF
COUNCIL OF THE BRITISH MEDICAL ASSOCIATION.

IN the following brief notes I have attempted to give prominence to some points which concern the naval surgeon and which are incidental to modern methods of big-gun firing at sea, and will at first call attention to the conditions attendant thereon.

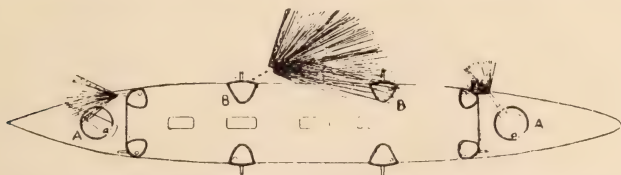
In modern battleships and, speaking roughly, the gun is inside a barbette, turret or casemate, and in that way is housed in all around. In other ships there are guns mounted on the upper deck and not surrounded by steel walls.

It is a very moot point whether the men serving the gun inside the casemate or those working on the upper deck battery suffer most from the effect of the firing, for there are two distinct factors to be taken into account. (1) The effect of the explosion at the muzzle of the gun, commonly known as the "blast;" (2) a violent shaking in the breech of the gun at the seat of ignition of the explosive, which shock is transmitted from the gun to the walls and roof of the casemate, and thence to the bones of the head, ear, etc. It is enough to remark, however, that they are so distributed that they would probably not damage the drum of the ear, although they do produce distinct concussions of the skull, spinal column, and the larger joints, and give rise to headache, tongue-bites, and general shock.

"BLAST" CONCUSSION.

1. The "blast" is the form of concussion which has far-reaching consequences upon those who come within its radius of disturbance, and it is only necessary to be on a level with the muzzle—on either side—and within a given distance to experience its

unpleasantness (Fig. 1); to be in advance of this plane intensifies the shock, and to stand over or be on one side of and in advance of the firing-point causes most painful symptoms. Examples of this are seen in the case of men standing close to any opening in the ship's side in the vicinity of the explosion, such as an open port, when the membrana tympani can be easily ruptured. Doors are wrenched from their hinges and iron stanchions bent.



A. Turret with sighting hood. B. Casemate with sighting hood.

Barbettes and turrets have sighting-hoods, consisting of armoured citadels, from which gun-fire is directed, and having a lifting roof so as to form a slot for taking observations—this in a line with the face. Much suffering may be experienced, whilst inside one of these or in a casemate, especially where a big gun is fired from aft, forward, or vice versa, close to the ship's side and in her length.

The occupant suffers at first a feeling of much shock; in one instance the cap was jerked off the head, and even the silk scarf which the seaman wore under the collar was jerked from the shoulders, whilst cotton wool has been torn out of both ears. Officers who have been subject to this say that in addition to the violent shaking there is a feeling of great depression at the pit of the stomach, followed by a tendency to be sick.

It is probable that while the missile is passing, and practically certain that when the air is forcibly displaced by it and by the gases which impel it, that a severe compression of the body surface takes place, the abdomen offering less resistance than does the chest with its cage in the form of ribs. A partial vacuum succeeds during an almost imperceptible period, and the effect produced must be one of suction. Briefly, the effect at first is one of compression, and secondly one of suction.

2. Modern guns tend to greater length than the older armament, and it will be obvious that for those men who are working at the rear of such guns the "blast" will have less disturbing effects.

3. Speaking generally, all ships' guns are fired at low levels, and there the air density is greatest and the intensity of air vibration is relatively increased accordingly. Again, concussions and air vibrations are known to be more violent over water and flat surfaces than on rough and broken areas, so that under this head it would appear as proved that the "blast" in naval guns is greater than it would be in a similar gun on shore.

4. The actual shock or vibration (previously mentioned in contradistinction to the "blast") which is transmitted to the gun and its mounting at the moment of firing is not so great afloat as it would be on shore, because of the resiliency which the water lends to the platform from which the gun is fired.

CORDITE.

This is the propellant par excellence of today. —The products of the explosion of cordite are permanent gases:

Carbon dioxide.....	24.9
Carbon monoxide.....	40.3
Hydrogen.....	14.8
Nitrogen.....	19.3
Methane.....	0.7

100.00

55.8 per cent of these gases are combustible, and with favorable conditions are always liable to give an after-flame. The conditions favorable are when the air is about two and a-half times the volume of the gases; the mixture becomes non-explosive when the air is as seven to one of the gases. This after-flame or flash is called the "back-flame" and may give rise to appalling accidents, such as the recent mournful catastrophe on board the United States battleship *Missouri*, where some thirty lives were lost. This form of accident is, however, fortunately of the rarest occurrence, although the gases which give rise to the "back flame" are ever present. Certain conditions favour the development of this flame, and the sudden inrush of air (especially when firing

up wind) when the breech is opened is considered the chief one and the rapid passage of the ship through the air under like conditions of the muzzle is another, although it can occur at any time, as cases have been known even when firing down wind. The flash is a very temporary or passing one and, therefore, imparts little heat, and in the navy precautions are taken of having all explosives covered with a protective skin made of silk cloth. The actual results of the flash in an ordinary working day are seldom more serious than singeing of the hair, face or clothing, and these are very exceptional.

THE TELESCOPE.

This instrument now plays a very important part in gun firing. It is fixed to the gun mounting, and does not recoil. First, the telescopic-sight assures an increased visibility of the object aimed at, although in this connexion it suffers some disadvantages.

The telescope mounting admits of elevation and deflection movements, and thus can be adjusted for fixed, movable, and swinging objects, and the seamen are taught these manipulations.

The usefulness of this instrument is at once manifest, especially when it is remembered that long-range firing (8,000 yards, etc.) is now receiving every attention. Taken all round, the British seaman must have normal vision as a primary qualification, but there are instances where presbyopia, due to age, must be considered, especially in our gunnery warrant ranks, and in the telescope we have, for this condition, a sight corrector.

Its uses will be materially interfered with where smoke from one's own gun's, smoke from the enemy's bursting shells, and spray, intervene; but what of the naked eye under similar conditions?

The surgical interests attached to the use of the telescope, as already recited, are few, and the injuries caused are slight *per se*.

The causes of any hurt are to be found in the fixity of the instrument to the gun mounting and not to any actual recoil on the part of the gun itself, for, whilst the gun recoils on the same mounting as that to which the telescope is fixed, the latter does not partake of anything more than the shock communicated to it,

through its mounting, by the gun. This shock is greater when small guns (12-pounders) are used, because the mountings of such are less substantial than those used for the 6-in. or 12-in. gun, and the explosion in the lighter gun is, by comparison, more violent than that of the heavier type.

Injuries are practically unknown where the latter are concerned and common with the former. The smaller type of gun is universally used in torpedo boat destroyers, but the great resiliency which offers in such craft when firing practically does away with the chance of injury.

A black eye, or perhaps a wound at the eyebrow, and which may require a couple of sutures, are what we are called to attend to, although there is generally a story of having been stunned or "knocked down" etc., with headache to follow. Although these may be trifling troubles, it is quite conceivable that in fighting times serious results might accrue if in the ship several layers of guns were even temporarily incapacitated, for of such men are the most valuable fighting units made up.

THE EAR.

This delicate organ suffers more damage from big-gun firing than any other part of the body, and we might very briefly consider the part each section of it plays in conveying air vibrations.

(1) *The Outer Ear.*—The irregular surface of the auricle collects the air waves, which fall upon it from all directions. These are reflected on to the lower wall of the external meatus, and thence thrown perpendicularly upwards on to the membrana tympani, which is concave and directed very obliquely downwards and inwards at an angle of fifty-five degrees to the axis of the meatus.

(2) *Middle Ear.*—The drum having received the vibrations in the most advantageous manner from the outside, transmits them across the middle ear by the chain of ossicles, which connects the convex drum surface with the fenestra ovalis, to the labyrinth. In this connexion it should be remembered that very highly-pitched sounds induce pain, and accordingly are resented by the terminals of the auditory nerve. Provision is made for diminishing the vibrations at the fenestra ovalis by the action of

the muscle which relaxes the stapes. This result is associated with the tightening of the drum, making it more liable to rupture. The Eustachian tube acts as an air tube, and balances the pressure of air on the inner surface of the drum.

(3) *Internal Ear*.—In this part of the ear the peripheral end-organs of the auditory nerve are expanded upon a small sac containing fluid. In addition to the waves which reach the sac by the fenestra ovalis through the ossicles, vibrations are communicated to this sac by the hard bony parts of the skull.

From this it will be seen that vibrations are conducted to the labyrinth in two ways, namely (*a*) via the outer and middle ear, and (*b*) through the hard bony parts of the skull.

When a sound ear is injured by gun-fire we generally look for (*a*) a ruptured membrana tympani, or (*b*) a permanent deafness due to repeated injury of the delicate nerve terminals in the internal ear, this being frequently spoken of as "gun-deafness;" (*a*) may be said to be "curable;" curable, that is, if attended to at once and if the patient discontinues firing. In (*b*) the deafness may be termed "irreparable."

If a typical case of ruptured membrana tympani be seen immediately after the accident from gun-fire smart local pain is complained of and the auroscope reveals a minute fissure with red, raw edges and a drop of blood at its lower end.

If the ear be merely plugged with wool and boracic powder, the patient being, at the same time, sheltered from further concussion, the drum heals by first intention. Should this accident occur and the man neglect having the ear attended to, the consequences might prove serious. The seaman makes light of any pain, which he probably considers inseparable from all explosions; and there are many cases, without doubt, where he continues his routine work as a gunner. The loss of hearing, it should be remembered, is not, as a rule, much marked and the injury remains masked; a "header," from the ship's side some day reveals the trouble, and he comes to the doctor for the first time.

Ruptured drums must then be considered to be fairly common—out of 300 casualties amongst the Japanese at the naval

battle of the Yalu in 1894, nineteen such cases have been recorded, and during the French manoeuvres of 1897 "several" are recorded. For the reasons mentioned, I am disposed to think that our own seamen seldom treat the accident seriously. The sick list, from whatever cause, robs a man of a certain amount of freedom, and at our big gunnery schools in England, where friends, home visits, etc., are interfered with, being placed on the sick list is felt to spell "punishment."

GUN-DEAFNESS.

"Irreparable deafness," commonly called "gun-deafness," is a condition regarding the pathology of which too little is known, and it is highly desirable that we should be better acquainted with it than we are today.

It exists with or without any visible sign (such as rupture of the drum) and both sides of the head are generally equally affected. Added to tinnitus, headache and general head discomfort may exist, but in the chronic case there is a marked loss of power of co-ordination of sound; the patient can keep up a conversation with one person by attentively watching him, but if a third person joins in the conversation he is not able to keep up in the discourse. There is a loss of power of detecting sounds that have been acquired by education, e. g., musical notes, heart sounds, breath sounds. In this detail the doctor can lose his cunning and there are examples of such.

This gun-deafness is not uncommon amongst men who direct the trials of sporting guns (rifles or shot guns) at the various butts where intending purchasers test their weapons, and gun-headache is far from rare amongst sportsmen after a big day's shooting. The clavicle conducts the vibrations to the remainder of the bony framework, and so to the skull.

The outer ear reveals nothing, when the drum is intact. The Eustachian tube may be quite patent. The deafness varies in degree, but is seldom if ever complete, as seen amongst naval officers. The gunnery officer is, for obvious reasons, most liable to this form of deafness, and his life of greatest activity, in the close neighborhood of big guns, lasts about nine or ten years, for, on reaching the rank of commander, his services are not confined

to gunnery, and it is reasonable to suppose that, if the original cause, namely, constantly repeated violent concussions be removed, the progress of the disease will be arrested though not cured.

When one admits this condition to be incurable and when so little is known of its pathology it would appear superfluous to discuss it, but as an excuse I would submit that some good may come of a consideration of the causes with a view to the prevention of the mischief.

When discussing the "blast" due to the explosion at the gun muzzle we referred to another form of violent shaking which is transmitted from the seat of ignition, and I am disposed to think that whilst the former is the most likely cause of ruptured *membrana tympani*, the latter must be considered a potent factor in the causation of internal ear-deafness in which the drum and ossicles may be (and generally are) intact.

(a) The officer directing, and the man firing, the gun are close to the breech and very intent on the result and that implies rigidity of limbs, spine, and neck, and this condition is shared by the muscles of the neck and face, the latter showing this by a state of staring and fixity of muscles. It will be seen that all these would tend to accentuate any shock by conducting the vibrations as if along a rigid rod to the hard skull bones, and in that way violently shake the fluid of the labyrinth which bathes the sensitive terminal nerves.

(b) Where big-gun firing is conducted day in and day out (as in gunnery schools) the injury becomes permanent.

Most men keep the mouth slightly opened during firing operations, and, although this equalizes the air on the drum, it must tend to intensify air concussions on the *foramen ovale*, and therefore increase the agitation of the fluid in the labyrinth.

PREVENTION.

Up to the present it is to be regretted that no device has been found that will sufficiently protect the ear from the violent concussions caused by the modern gun. To protect the *membrana tympani* cotton wool is useful as diminishing the violence of the air waves proceeding in its direction, and for some

time now a doughy substance has been largely used for plugging the external meatus; lastly, it is recommended to keep the mouth slightly open. The use of loosely packed cotton wool is recommended in the outer ear; packed so that it shall not touch the tympanum. Or, ear-bags might be supplemented but it must be remembered that, whatever the device used, the hearing will be interfered with—a serious condition where orders of command are of vital importance. For the violent shocks india-rubber soles for the boots and ditto laid on the deck in the vicinity of the gun would of course diminish the upward vibrations. We have Surgeon General Suzuki's statement that cotton wool only was used for the ear during the recent naval actions and that there were several ruptured tympani.

Experiment shows that if the irregularities of the auricle are filled with wax or oil, and so give it a smooth surface, that the intensity of sound is weakened, and I have advised vaseline to be tried for this purpose, but with doubtful results. Again, nipple-shaped india-rubber plugs have been used. The direction of the meatus externus to the source of sound is material. If the side of the head is directly opposite to an explosion the ear will suffer a more violent concussion than if the full face were opposed to it. A gun's crew, however, are so variously disposed that no definite lines can be laid down for observance.

Neither officers nor men take kindly to the use of artificial means—cotton wool, etc.—although the practice is more universal than it was a few years ago. The discomfort caused by the presence of a foreign body in the ear, added to the dullness of hearing produced, are the chief reasons for this, and, the sailor considers it to be too effeminate.

MALARIA AND MOSQUITOES AT LUCENA BARRACKS, PHILIPPINE ISLANDS.*

BY CAPTAIN HENRY PAGE, A.M.(PRINCETON), M.D.(U. PA.)
MEDICAL DEPARTMENT, UNITED STATES ARMY.

IN June 1904, in compliance with official orders, I reported for duty as surgeon, at Lucena Barracks, P. I., and found, briefly stated, the following conditions:

(1) A post situated in Tayabas Province, Southern Luzon, P. I., at the foot of a high range of volcanic hills, and three and one-half or four miles from the sea. The elevation of the post above sea level, was, probably sixty feet.

(2) A soil one or more inches deep, underlying which was a soft, sticky, porous clay bed about a foot thick, and beneath this, a clay almost impenetrable, and of unlimited depth.

The whole camp area had been used, until the post was selected about one year ago, as a large rice field, and to this day the marks of the rice dykes are plainly seen.

(3) Drainage was accomplished at the post by means of innumerable small surface ditches, but on account of the rice dykes, whose object was to retain all moisture, and prevent any drainage, these small canals had to be made efficient by filling in low areas and holes, such as caribou wallows, excavations around and under the buildings, etc.

(4) Vegetation was more than usually abundant, and in spite of heroic efforts to keep the post clean, every spot, except around the buildings, and on a part of the parade, was covered with brushes and high grass.

(5) The meteorological conditions were highly favorable to the production of mosquitoes, as throughout the entire year there is just enough rainfall to keep the post continually wet.

(6) The post was built covering a tremendous area being

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scattered all over the reservation. It was on account of this large area, that the police parties could not keep up with vegetation; as fast as one end was cleared up the other end was again foul.

(7) The environs of the post were on one semi-circumference inhabited by natives, whose huts in one spot approached within less than 100 feet of the company lavatories. The areas not filled with dwellings, were inhabited by caribous, whose wallows fringed this side of the Reservation. A stream with its swampy overflow banks marked the Reservation boundary.

The other semi-circumference was bounded by a large river with banks fifty feet high, and filled with a dense tropical growth.

I have given the above résumé of conditions to illustrate how adverse they were to any successful mosquito warfare.

A soil never dry and in which a foot print of horse or man would hold water for days; a dense undergrowth, a level rice paddy filled with holes and depressions, which the undergrowth frequently completely concealed. These were some of the many discouraging features to be combatted.

My first remark upon sizing up the situation, was to the effect that if malaria could be stamped out here, it was possible to get the same result anywhere on earth, for at this post no feature was lacking to make it an ideal home for the anopheles mosquito. This interesting insect evidently was of the same opinion, for no part of the whole country was free from him.

The camp sick records showed too that he had not been idle.

A company of cavalry, the year before, had been practically routed by the disease, and of the troops present, when I reported for duty, it was calculated that a most modest estimate would place the ratio of the malarious to non-malarious at three to one.

Fortunately the infection in ninety per cent of all cases was with the benign tertian parasite; but the malignant form did exist as was shown in many blood examinations. Two of the latter cases had most malignant manifestations, and caused death. One of these deaths occurred just prior to my arrival; the second case an ex-soldier's wife, summoned me at eight a. m., after being sick about twelve hours. Quinine was given by the mouth, while awaiting a microscopical examination of the blood which latter

disclosed multitudes of malignant tertian parasites. After the examination of the blood, hypodermics of quinine were ordered; but the patient died at 8:30 before the first one had been given. This case showed but few of the classical signs of malaria, the fever was not high, and the only complaint was of headache, which, however, was not severe.

A third case occurred in the husband of this woman. He had learned the lesson of danger in delay, and sent for me when first taken ill. I suspected his diagnosis, and went armed with a microscope, and a hypodermic syringe. Malignant tertian parasites were quickly discovered, and the hypodermic was promptly put into action. I believe that a delay of half an hour, would have caused this man's death, as it was, he after a narrow escape, recovered in a few days, left Lucena (and forgot to take his quinine), went to Manila, re-enlisted, and I discovered him two days ago in my wards at Camp Darago, P. I., with his first attack since leaving Lucena six weeks ago. No parasite could be found as he had taken a dose of quinine when first taken ill; but the usual dose of that drug caused prompt relief, and he is now free from fever.

A fourth case of the malignant fever found at Lucena, proved more intractable, the diagnosis, confirmed by repeated microscopical examinations, was malignant tertian fever. The manifestations were not extraordinarily severe, and quinine by the mouth, one gram t.i.d., was ordered. This had no effect whatever on the fever, which ran almost always steadily between 102-103; at the end of a week, to my surprise, I again found his blood filled with the parasites, and then ordered hypodermics of quinine, which were given t.i.d., in increasing doses, until at the end of a week, he was taking forty-five grains of quinine in the subcutaneous tissues daily, the hydrochlorate of quinine being used. This severe treatment had no effect whatever on the fever; but the parasite could not be found. A week without quinine was then allowed to pass, during which every effort was made to discover any other cause to account for the temperature, which had remained steady, entirely independent of the amount of quinine thus far administered. The man's feeding had been forced, and

he felt fairly well, and had no symptoms whatever except fever, headache, and weakness. Widal's test was negative, the lungs and kidneys, etc., were all normal; but at the end of a week without quinine, the parasites were again found in the blood. I, having been now convinced, that malaria alone was causing the difficulty, ordered sixty grains of quinine hydrochlorate, by hypodermic injection daily. After two days of this heroic treatment, the fever disappeared, and the man asked to be returned to duty, feeling perfectly well, but weak of course.

The quinine used in this case, was taken from the regular stock, and was too thoroughly tested before and afterwards, to admit of any doubt as to its strength.

This was one of those cases where the doses prescribed by text books were not able to do the work.

The best writers on malaria, all state that "twenty to thirty grains of quinine daily, if properly given, will control any malignant seizure." My answer is, "come to Lucena for thirty days, and you will change your mind."

Ordinarily, small doses will do the work; but the dose of quinine varies largely with the case, and with the locality.

This was the first locality that I had ever found, where twenty to thirty grains of quinine daily were not sufficient; but I soon found that in a vast majority of cases this was insufficient, and the standard dose was raised to forty-five grains daily.

THE MOSQUITO CRUSADE.

A general order of the Philippine Division requires the surgeon to have kerosene oil placed on all pools and mosquito breeding places, and further orders all persons to use the mosquito net whenever sleeping, day or night.

This order has been supplemented by various circulars and post orders, and is fairly well obeyed at all posts.

At Lucena, at my request, the commander of the post, re-issued these orders, emphasizing strongly the necessity for strict compliance. This officer, at my request, also issued an order, which enabled the surgeon to dismiss from the hospital, any Q. M. employee who neglected to use his mosquito net properly,

and stated in the order, that the penalty for this offence was dismissal from government employ.

In order that no spot should be closed to the surgeon in his inspections, the commanding officer, by request, issued another order directing the surgeon to inspect and report upon the surroundings of officers' quarters once a week.

Armed with this ample authority, and provided with a detachment of the police squad, I first spent several days going over every foot of ground in the reservation, making note of all low places where water could collect. These places I tabulated, placing the most dangerous spots at the head of the list, and gave the list to the provost sergeant, who, subject to the direction of the commanding officer, promptly filled up the offending pools and bogs.

The commanding officer on August 15th, 1904, estimated that more than 400 loads of earth had been used in this way, and when the extreme hardness of the clay soil is taken into consideration, one can judge what an immense amount of labor this involved. As an illustration of the value of preliminary inspections, I might mention that fifty feet back of one of the barracks, I discovered a collection of water that no one knew existed. It required fifteen large loads of earth to level off this space.

Having found all the mosquito pools, I then thoroughly oiled them with kerosene oil, repeating the process every ten or fifteen days, according to the weather.

It required twenty gallons of oil economically expended to cover the pools at first. Six weeks later ten gallons of oil were sufficient, on account of the work done in filling up the low places.

This "oiling of the post," was most carefully done. It required the services of four men to carry and distribute the oil, while the sergeant and I, mounted, located the pools, and directed the expenditure of the oil. It was our object to discover even every foot print that contained water, and it is believed, that this was fairly well accomplished.

During the process of oiling the post, a careful search was made for bottles, tin cans, bamboo joints, hollow tree trunks,

and other hiding places for the anopheles larvae, and many hundreds of such places were destroyed.

All accumulations of brush were burned when sufficiently dry, and special effort was made to burn tall grass that acted as a cover for the insects, and was not tall enough for a screen.

The commanding officer, in addition to this, had all ditches regraded, culverts were built at road crossings, and new ditches dug wherever indicated.

In order to enforce strictly the mosquito net regulations, I directed a Hospital Corps Sergeant to occasionally go through the company barracks during the afternoon siesta hour, and also at night, and all men who were not using the mosquito net properly, were tried by summary court martial.

These measures, above briefly stated, were in force for the six weeks I remained at Lucena.

In such a short length of service, it is impossible to draw any hard and fast conclusions as to what the final results shall be. The encouraging features of the enterprise, however, were that the new cases of malaria reporting at the hospital with ague, decreased from two to six daily, to one or more a week.

All cases as they were treated were given a "following up treatment," which consisted of decreasing doses at intermittent periods, lasting over a period of seven weeks. This treatment consumed large quantities of quinine; but in spite of this expenditure, the issues of quinine, which at the beginning of the "mosquito crusade," averaged 580 grains daily, during the last week of my stay in Lucena amounted to 990 grains, or a daily average of 141 grains, or less than one fourth formerly used, and this, too, under a more liberal system of issues.

These facts encouraged me to believe that malaria was fast being eliminated from the post, and I feel regret that my tour of duty should end before the result was proven.

In order to determine whether or not the kerosene treatment was effective, I bred mosquitoes from samples of water obtained from certain pools that were in dangerous localities, using large glass jars containing sand and algae sprouts upon which the suspected sample of water was poured. I found numerous anophe-

les larvae at first; but later only an occasional larva could be found. Whenever found, I reiled the pool.

Frequently, at first, the larvae were so numerous that they could be discovered with a glass, or even the naked eye; but at the end of my tour of duty, it was a rare occurrence to find the pools infected.

Mosquitoes in the quarters were never a great pest, strange to say, but the majority of those found were of the anopheles variety. At the time of my departure they had greatly decreased, and particularly was the anopheles more rarely found.

In order to stimulate the interest, and gain the co-operation of the inhabitants of the post, I prepared the following set of "questions and answers," which the commanding officer had published to the troops. The commanding officer recommended that these "questions and answers" be printed by the authorities in Manila, and given wide distribution; but I have not heard what action was taken.

By request I furnished a copy of these "questions and answers" to the commanding officer of Scouts at Lucena, who desired to have them published in Tagalog and Spanish for distribution among the native troops and the more intelligent natives.

I cannot say that I think this is the best that can be produced in the line of "mosquito and malaria" information; but it seems to me that literature of this class, deserves wide distribution, not only among troops, but among the residents of every malarial community.

MOSQUITOES AND THEIR RELATION TO MALARIA.

There is no good reason why any community should be mosquito ridden, and particularly is this true of a military community where intelligence is above the average and where military police insures at the start a certain degree of mosquito prevention.

Up to a certain point the Medical Department of a post is able to do much, but unless it has the co-operation of others, it can not pass beyond this point and be absolutely successful.

As the safety of every individual depends upon a complete success in the "anti-mosquito crusade" which the Medical Department is continually conducting, it is thought that an appeal to every person to lend his aid will result in interesting a number who will voluntarily take a patriotic stand in this important matter.

This matter is important first because the removal of the mosquito removes an annoying pest, and second because no mosquitoes means no malaria, the latter a consideration which effects the health of every man, woman and child and has proven to be a matter of death to two persons during July 1904 at Lucena—one a soldier, another a native, both of whom died of “Pernicious Malarial Fever”—a preventable disease.

The following questions and answers will give all information needed for an intelligent understanding of what is required of volunteers. The answers are facts accepted by the world as proven beyond question and no attempt at proofs will be included in them.

CHAPTER I.

Question (1).—What is malaria?

Answer—A disease caused by the presence in the blood of a minute animal (a protozoan) which destroys the blood elements and manufactures a poison which causes fever.

Question (2).—How does this parasite get into the human blood?

Answer—As far as is known by scientists the mosquito is the sole carrier of malaria.

Question (3).—How does the mosquito get malaria to carry?

Answer—By sucking the parasite principally from man; crows and other birds and animals may have malaria and transmit it to mosquitoes, but this is probably rare.

Question (4).—Does every mosquito carry malaria?

Answer—No. As far as is known only the “Anopheles” variety can carry the parasite and transmit it through its sting to the human.

Question (5).—Does every bite of the Anopheles Mosquito cause man to be infected?

Answer—No—unless the mosquito has previously bitten a malarial man, it is as harmless as other mosquitoes.

Question (6).—If an “Anopheles” Mosquito has malaria from biting a malarial man, how many persons can it give the disease to?

Answer—An indefinite number. The old idea that the mosquito died soon after it had filled with blood is a mistake.

Question—What lessons are taught by the above questions?

Answer—(a) That malaria is carried by mosquitoes.

(b) That as long as the malarial mosquito (Anopheles) is present, malaria is a menace.

(c) That a man may be free from malaria even though the malarial mosquito is abundant.

(d) That the presence of a man having malaria in a mosquito ridden community is more dangerous than a case of small-pox unless the malarial man is as carefully isolated.

(e) That a malarial mosquito that has malaria from biting a malarial man can carry the disease to many persons, who in turn can infect other mosquitoes and thus continue the work until all malarial mosquitoes and all men have the disease.

CHAPTER II.

Question (1).—Is malaria a dangerous disease?

Answer—"It is more dangerous to man in the tropics than" yellow fever, plague, small-pox, or "any other one factor" (Craig), i. e. it causes more disability,

Question (2).—Why?

Answer—Because it attacks all unprotected persons and unless treated frequently causes death. Even if treated it undermines the health and occasionally causes sudden death—(congestive chills). No other disease is so universal.

Question (3).—Are you in danger of sudden death from malaria?

Answer—You may have an attack of "Pernicious Malaria" and die before remedies can be absorbed by the system even though given by hypodermic injection at once. (Two cases of this kind were seen at Lucena Barracks, in July 1904.)

Question (4).—Is malaria curable?

Answer—Some forms of malaria are easily cured by quinine and even without quinine many persons cease to have fever (or else there would be no natives in the tropics). Some forms of malaria act too quickly to be cured. (Vide Question 3.) Other forms of malaria become chronic and while controlled partially by quinine, it may be years before the blood is free from parasites.

Question (5).—Can a person's health be suffering from malaria and not show the ordinary symptoms of the disease?

Answer—Yes. In an examination at Lucena a part of one company showed about fifty-five per cent of malarial cases and only about five per cent of these men were having chills.

Question (6).—How many men at Lucena have malarial parasites in their blood?

Answer—Seventy-five per cent is considered a very small estimate.

Question (7).—What lessons are taught by Chapter II?

Answer—(a) Malaria is an extremely dangerous disease; it always cripples and often eventually causes death.

(b) It is curable but the cure is not complete frequently for months or years.

(c) A person may have the disease and not know it, but he may give the disease to mosquitoes who in turn may give it to other men.

CHAPTER III.

Question (1).—How can a man prevent malaria in himself and others?

Answer—By protecting himself against mosquito bites.

Question (2).—Why?

Answer—Because the disease can only be carried by the mosquito.

Question (3).—What means have you of protecting yourself?

Answer—By never sleeping day or night except under the protecting mosquito bar and continually watching at all times during the day that no mosquito bites you.

Question (4).—What other means of protection have you?

Answer—By destroying all mosquitoes so that there will be none left to bite, you can be entirely safe.

Question (5).—Which of these measures is most important?

Answer—The latter.

Question (6).—Why?

Answer—Because if all mosquitoes are destroyed no one can get the disease whereas, if mosquitoes are not all destroyed one may bite you in spite of all precautions.

Question (7).—Is it possible to destroy all malarial mosquitoes?

Answer—It has been done in many places and can be done here, although the soil in Lucena is so wet that it will require eternal vigilance.

Question (8).—What lessons are learned from Chapter III.

Answer—(a) Malaria is a preventable disease.

(b) It can be prevented by destroying the enemy (the malarial mosquito) or by wearing armor (the mosquito net) against him.

(c) If all mosquitoes are destroyed the net becomes a safe-guard and not a necessity.

(d) It is possible to free every community of malaria.

CHAPTER IV.

Question (1).—If you are openly careless with your rifle and flourish it around until it "goes off" and kills a man are you a criminal?

Answer—Yes. That is manslaughter.

Question (2).—If you have malaria and are openly and willfully careless about letting mosquitoes bite you are you a criminal?

Answer—Yes. Mosquitoes may bite you and then bite a comrade and he may die as a result of your carelessness. Morally speaking that is manslaughter although you may not be punishable by legal processes.

Question (3).—If you have malaria what then is your duty?

Answer—To use every safe-guard to see that mosquitoes never bite you and thus catch malaria which they can carry to your comrades.

Question (4).—What lesson is learned from Chapter IV?

Answer—A conscientious man must be more careful to guard against mosquito bites when he has malaria than when he is well for when he is well the mosquito may injure the man alone. If he has malaria the mosquito which bites him becomes a source of danger to every man, woman and child in the community.

CHAPTER V.

Question (1).—How can the malarial mosquito be made harmless?

Answer—By never allowing it to bite a malarial man.

Question (2).—How can it be destroyed?

Answer—By oiling with kerosene every pool of water that can not be filled up with earth.

Question (3).—How does this destroy the mosquito?

Answer—The mosquito seeks the pool into which it may lay its eggs. It falls into the oil on the water and is destroyed.

Question (4).—Does the oil do anything else?

Answer—Yes. It destroys the young mosquito as soon as it hatches out.

Question (5).—How long does it take a mosquito egg to become a flying mosquito?

Answer—The time varies according to the temperature but it is safe to allow ten days as a minimum.

Question (6).—What are the lessons taught by Chapter V.

Answer—(a) Coal oil will destroy both mosquitoes and mosquito larvæ (young mosquitoes).

(b) Coal oil should be put on pools in hot weather every ten days. In cool weather twice a month.

CHAPTER VI.

Question (1).—Where is the malarial mosquito apt to be found?

Answer—(a) In pools around houses.

(b) In old bottles having water in the bottom.

(c) In old tin cans on the "dump heap."

(d) In old post holes.

(e) In horse tracks in wet soil.

(f) In bogs where there is shade and standing water, particularly if "green scum" is present (this is mosquito food).

(g) In neglected rain barrels.

(h) In water cans in bath rooms.

(i) In flower vases where the water is long left standing.

(j) In flowers and plants where water can collect in curled leaves (as in bananas).

(k) In joints of bamboo.

(l) In the water cups of grind-stones.

(m) In any place where fresh water won't evaporate within ten or fifteen days.

Question (2).—What then is your duty as a volunteer in the "mosquito crusade"?

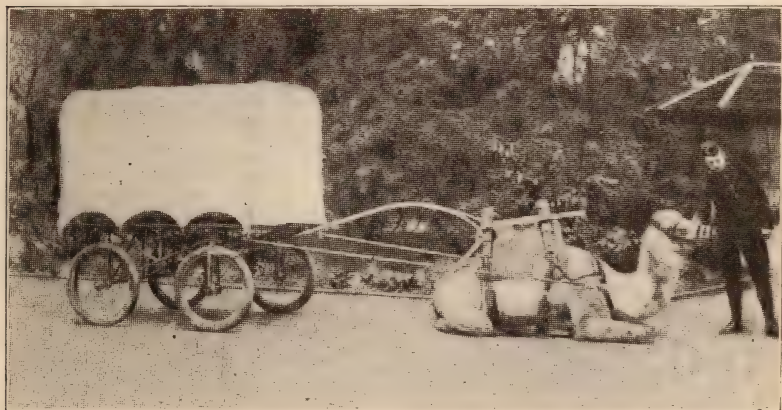
Answer—(a) To always sleep day or night with your mosquito net down and tucked in at the sides.

- (b) To examine the net night and morning and to see that it is not torn and to kill any mosquitoes that have entered by accident.
- (c) To report to the First Sergeant or if necessary to the Company Commander or the Surgeon any man who is not as careful about his mosquito bar as you are.
- (d) To never pass a bottle, tin can, or other mosquito breeding place without destroying it.
- (e) To never allow bottles or empty tins to be thrown into the brush around houses and barracks without calling the offender to account and reporting him if he does not correct his mischief.
- (f) To have your eye trained to find mosquito breeding places that are apt to be overlooked, such as the cans under the "bread box" or the "drip" under the refrigerator, and to see that these places are kept well oiled with kerosene if they can not be entirely removed.
- (g) It is your personal duty to fill up any bogs, post holes, and wet places near your barracks. Do not wait for "orders" or for someone else to "start" but by your industry and public spirit set a good example and put to shame the loafer that sits on the back porch and laughs at you. You are the good citizen and he is the fool and you can afford to ignore his jests and put him to shame.
- (h) It is your duty to put kerosene oil on all wet places near your barracks that can not be filled up and drained. Two tablespoonfuls for every fifteen square feet is all the oil required to give complete protection and this need be renewed only every ten days.
- (i) It is your duty to consult the Surgeon if you need further information or need oil to use in mosquito pools. Advice and coal oil are at the command of every one and both will gladly be given.
- (j) It is your duty when on pass to avoid places that are mosquito ridden. If you are on furlough or pass or any duty that requires spending the night away from your company net buy yourself a net for night use. It will be a good investment.
- (k) If you go on a "practice march" or on a campaign hang on to your mosquito net and carry if necessary a few ounces less rations, for if you catch malaria you will lose your appetite and your rations will be of no value to you.

Contemporary Comment.

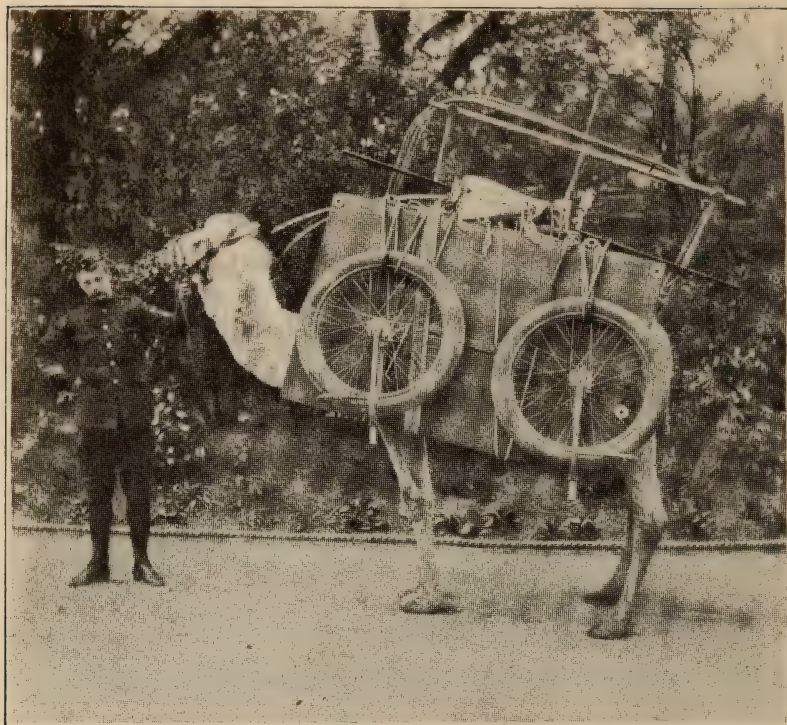
THE CAMEL AMBULANCE.

THE camel ambulance, invented by Lord Dundonald of the British Army, is well shown in the accompanying illustrations and is especially adapted for desert service. It packs compactly upon the animal by which when set up it is to be drawn, is light and with its broad tires will not sink deeply into the sand. Two recumbent or eight seated patients or one recumbent and four seated patients may be accommodated by it.



The Dundonald Camel Ambulance Set up for Use.

It presents many interesting suggestions for consideration in connection with other ambulances. The use of the bicycle wheel or the automobile wheel, with a strong rubber tire is well worthy of consideration for horse as well as motor ambulances, from the standpoint of comfort to the patient. The steel as a material for wheels commends itself for strength as well as lightness.



The Dondonald Camel Ambulance Packed for Transportation.

NOTE ON MILITARY ANTHROPOMETRY.

AS a result of the examination of 223 horse soldiers in their first and seventh years of service, i. e. respectively at the age of twenty-two and twenty-nine years, Captain Hans Daae (*Norsk tidsskrift for militar medicin*) remarks that their reach was five to nine centimeters longer than their stature, the chest girth two to four centimeters longer than half of their stature, and the trunk larger than half the stature, but two to three centimeters less than the chest girth. The average weight was 68.3 kg. or 403 gm. per centimeter. The recruits of the Norwegian mounted service have a higher maximum measure and greater weight per centimeter of length than that of other countries.—HANS DAAE.

Medico=Military Index.

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Editorial Expression.

MILITARY MATTERS AT THE BOSTON MEETING OF THE AMERICAN MEDICAL ASSOCIATION.

MILITARY matters were quite in evidence at the meeting of the American Medical Association in Boston last month. Full delegations representing the Army and Navy and Public Health and Marine Hospital Service were in attendance, and the Army was represented by a field hospital under the command of Captain Basil H. Dutcher and Lieutenant Conrad E. Koerper. Located adjacent to the new Harvard Medical School, which was perhaps the chief center of the scientific work and social entertainment of the Association, it was conspicuous and attracted much attention. Another instructive feature of the meeting was an exhibition drill of the Massachusetts Volunteer Militia Ambulance Corps, with a number of interesting addresses by visiting medical officers.

Both the American Medical Association and the American Medical Editors Association adopted resolutions urging the Speaker of the House of Representatives to put the Army Medical Reorganization Bill upon its immediate passage. Interesting papers were read by Majors Woodruff and Lynch, which attracted much attention.

The Association of Military Surgeons was represented by its President and Secretary, the latter of whom read a paper upon "The Profession of Medical Journalism" before the American Medical Editors Association, and was elected President of that body for the ensuing year. At the Medical Editors banquet, Surgeon General Wyman and Major Jefferson R. Kean made notable addresses, and altogether the occasion was one of interest and value to the military medical departments.

THE EMPRESS MARIE FEODOROVNA PRIZES.

A YEAR or two ago the establishment of the Empress Marie Féodorovna prizes for military medical aid was announced in this JOURNAL. In the forthcoming Red Cross Convention of 1907, these prizes will be awarded for the first time, and it is hoped that American inventors will be in active competition. It is announced that the Central Committee of the American National Red Cross will receive and forward, at its own expense, the plans, models, etc., of competitors, provided they meet the approval of a sub-committee, which will be appointed to pass upon them. Any competitor, who prefers however, may forward his invention direct to the jury. Correspondence concerning this question is invited by the American National Red Cross, War Department, Washington, D.C. The regulations for the contest are as follows:

1. The fund consists of a gift of 100,000 roubles from the august patroness of the Russian Red Cross Society, and bears the name of the Empress Féodorovna International Red Cross Fund.
2. The fund is confided to the care and administration of the central committee of the Russian Red Cross. The interest on the fund is designed for prizes for the authors of the best invention to mitigate the sufferings of sick and wounded soldiers.
3. At first the prizes are designed for inventions for the finding on, and carrying from, the field of battle of the wounded on land and at sea; the means of most rapid and least painful transportation to the nearest post of medical aid; and for the final evacuation of the wounded. The next International Red Cross Congress will decide the question as to whether in the future these shall remain the objects of the prizes, or if they shall be extended to other inventions in the vast domain of aid to the sick and wounded. It will belong to each of the future International Red Cross Congresses to specify the nature of the inventions or perfection of inventions for which these prizes may be designated.
4. The authors participating in this competition must exhibit their inventions at the exposition to be held every five years at the time of the Congress of the Red Cross.
5. These prizes are awarded by a special international jury, whose members are elected by the International Committee and the Central Committees of the Red Cross Societies.
6. The jury is composed of eight members, of whom the Central Committee of the Russian Red Cross has the right to name one and the International Committee one. The VII Congress selected the six central com

mittees, each of which was to elect one member, To permit all the central committees successively to be represented on this jury, at each congress two central committees are withdrawn and replaced by two new central committees to be chosen by the Congress. The jury elects its own president.

7. The prizes consist of the interest of the fund of 100,000 roubles for five years, deducting the expenses necessary for the work of the international jury. It is the duty of each central committee to make public the program of this competition.

8. If the competition does not yield satisfactory results, the jury is not required to present the full amount at its disposal. The surplus will go to the increasing of the number and the amount of prizes in the next competition.

9. The prizes offered for the competition of 1907 are three in number to those who will present entire or in part the best solution of the problem of aid to the wounded, the most prompt and sure means of finding and carrying the wounded from the battlefield, on land and at sea; the best type of wheel litters, of vehicles for the transportation of wounded to the first dressing station with the greatest rapidity and the least suffering possible: the means of life saving at sea; the best arrangements for ambulances, cars, on board ships, etc., for the final evacuation.

10. The international jury will present at the VIII Congress a report on its work, and will formulate propositions concerning the number of future prizes and their mode of division. It will belong to the Congress to settle definitely the object and amount of the prizes.

COLONEL RAINSFORD ON THE RELATIONS OF THE BRITISH MEDICAL SERVICES TO THE LINE.

WE are informed that the remarks of Colonel Rainsford, in the discussion of his paper on page 436 of our June number, are incorrectly reported and give an absolutely untrue effect.

Colonel Rainsford desires also to correct the report of his remarks in the discussion upon field service conditions in the December, 1905, JOURNAL, since he wished, in no way to depreciate the importance of first class nursing in enteric fever, but his remarks were intended simply to traverse the opinion of the preceding speaker, who stated that there was only one means of decreasing the mortality of enteric fever (presumably in war) and that was by good nursing, or words to that effect. He called attention to the fact that the mortality from enteric fever in war depended upon the number of cases, and that the number

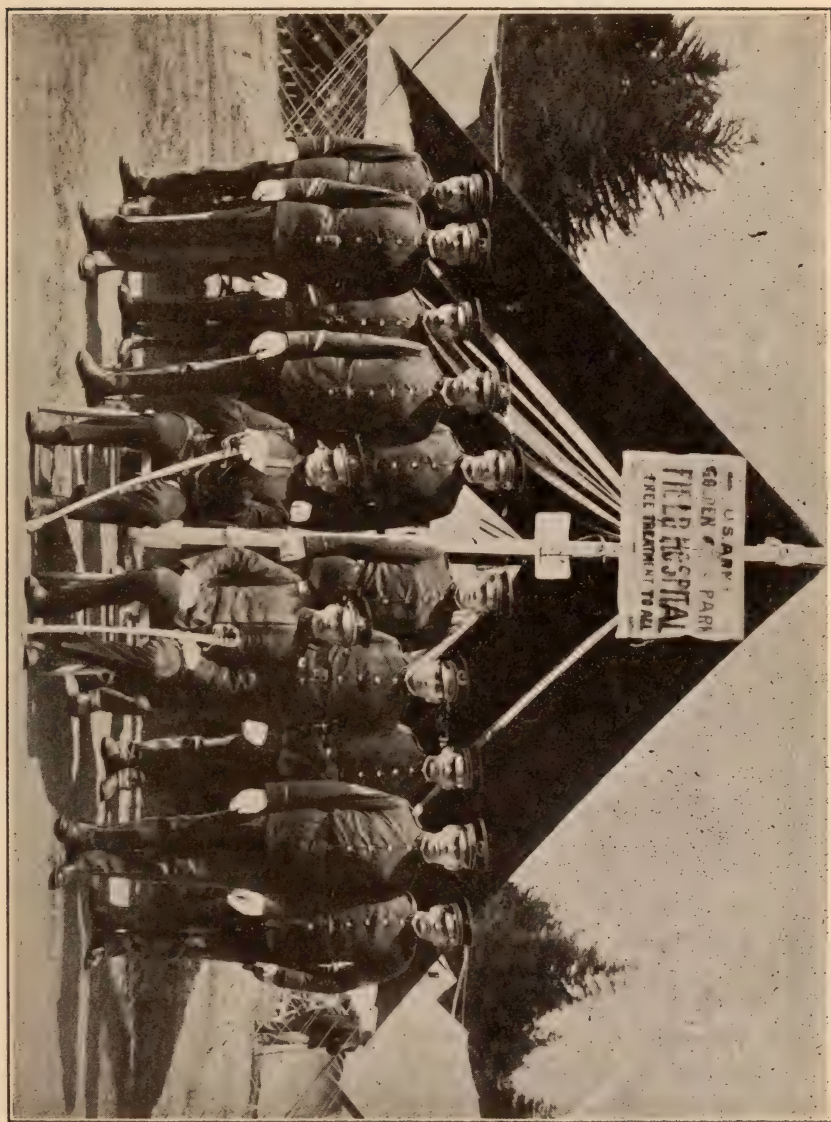
of cases depended upon the efficiency of sanitation, also that the large percentage of deaths in enteric fever during campaigns depended more upon the virulency of the type of infection in men physically exhausted by the hardships of active service and suffering from the reaction that so often follows the intense and prolonged excitement of the fighting line, than any other cause.

THE WORK OF THE MEDICAL DEPARTMENT OF THE UNITED STATES ARMY AT SAN FRANCISCO.

WE find in the *Army and Navy Register* for June 9th so interesting a note upon the work of the Army Medical Department, in connection with the San Francisco catastrophe, that we reproduce it, together with the illustrations kindly loaned us for the purpose. The *Register* remarks that:

"On the day in which the news of the disaster reached Washington, that is to say a few hours after the breaking out of the big fire on the morning of the earthquake, the surgeon general of the Army took steps to have shipped from St. Louis to San Francisco a train load of medical and surgical supplies. The medical officers on the ground at once applied themselves to the arduous task of establishing temporary hospitals and arranging for the treatment of those who were injured, as well as those who were sick. It is one thing to establish and maintain a field hospital even in time of war, and it is quite another thing to establish hospitals in a stricken city. In the former case, the medical officers are prepared for the work and its emergency. In the latter case there can be no such preliminary work. The general sanitary situation was in charge of Lieutenant Colonel George H. Torney of the medical department, who worked faithfully and well until relieved of the duty by General Greely, who transferred the duty to civilian authorities.

"A branch of the medical work which has been done in San Francisco is the Golden Gate Park Field Hospital, in charge of Captain H. L. Gilchrist, who has associated with him in this work Lieut. William T. Davis, of the medical department. The field hospital was erected and maintained by the members of Company



The Medical Officers and Non-Commissioned Officers of the Hospital Corps at Golden Gate Park Field Hospital.

A of the hospital corps, which left Washington on April 21, under command of Captain Gilchrist. Orders were received one morning for the departure of the company for San Francisco, and by afternoon the company was ready to go on board the train. This incident showed what could be done in the medical department to meet an unexpected call for duty at a distant place. The command went fully equipped in all respects, and on arrival in San Francisco proceeded to the work of establishing a field hospital which was located at Golden Gate Park.



General View of Golden Gate Park Field Hospital.

"In this institution is an isolation hospital, established in anticipation of a typhoid epidemic in the large colony of refugees, but there have been only two cases of typhoid, owing to the maintenance of excellent sanitary conditions. According to the latest reports, there were 130 patients in the field tents; includ-

ing some emergency cases and others of longer duration.

"Observers who have no connection with the Army and who have excellent opportunities of seeing what is going on in San Francisco unite in praising the Army medical officers and the hospital corps men for their excellent work. They accomplish much more than would be done by the civilian inspectors from the municipal health department, and it is a question whether the civilian authorities will exact the same observation of the rules for the preservation of health which have been adopted and enforced by the Army medical officers. A part of the problem which confronts the health board in San Francisco is the housing

of the refugees during the next year. It will probably be at least twelve months before all of them are in homes of their own and in the meantime there must be, it is held, some way of quartering many families which are now living in tents. This may be done by means of three room buildings erected on city land and rented at the rate of \$3 per month. A community which lives in this fashion, will have to observe sanitary conditions with great care.

"Two interesting pictures are printed in this issue. One gives a general view of the Golden Gate Park Field Hospital under Captain Gilchrist. Up to May 19 there had been 500 patients received and at that time there were as many as 300 people receiving daily treatment at the free dispensary connected with the hospital. The rough sign attached to the tent bears the legend, "U. S. Army Golden Gate Park Field Hospital, Free Treatment to All." The general view of the camp gives an idea of its extent and arrangement."

SKI SLEDGES FOR THE WOUNDED.

TWO pairs of skis, that is four skis, says Captain Reichborn-Kjennerud (*Norsk tidsskrift for militar medecin*), form a couch for a wounded man in the following manner: The tips of the skis are tied on to a stick which is laid over all the four tips of the skis, and a similar stick is tied on to the four skis at the point where the feet are to be. In the year 1902 in the wild mountains of Norway, a man weighing 99 kg. fell far from any human being, and suffered a dislocation. He was transported on such a couch. The couch which is made for a wounded man on such a ski sledge is hard. By fastening an iron band across the skis, the army stretcher may be comfortably placed on the sledge. A practical ski sledge, made out of one pair of skis, however, is yielding and forms a soft and agreeable couch, as shown by the author's experiments.—HANS DAAE.

News of the Services.

Dr. George F. Adair, U.S.A., returned from temporary duty at Madison Barracks to Fort Wadsworth.

Acting Assistant Surgeon W. E. Addis, P.H.&M.H.S., granted one month's leave.

Brigadier General Charles Henry Alden, U.S. Army, Retired, a former President of the Association of Military Surgeons of the United States, and a member of the Executive Council, died June 7, 1906, at Pasadena, Cal.

Assistant Surgeon A. E. Allen, U.S.N., ordered from the Philadelphia Navy Yard home.

Assistant Surgeon A. H. Allen, U.S.N., appointed with the rank of Lieutenant (j. g.) May 2, 1906.

Passed Assistant Surgeon J. W. Amesse, P.H. & M.H.S., ordered to Stapleton, N. Y., for special temporary duty, thence to rejoin station at Ellis Island.

Lieutenant Colonel Daniel M. Appel, U.S.A., on temporary duty in the office of the Chief Surgeon, Department of California, and appointed member of Retiring and Examining Boards at San Francisco.

Passed Assistant Surgeon F. A. Asserson, U.S.N., ordered from the Naval Medical School to the *Arkansas* temporarily, and thence home to wait orders.

Assistant Surgeon J. W. Backus, U.S.N., ordered from the Naval Medical School to examination for promotion, and then to wait orders.

Surgeon P. H. Bailhache, P.H. & M.H.S., granted one month's leave.

Lieutenant Colonel J. M. Banister, U.S.A., relieved from treatment at the Washington General Hospital and returned to Fort Riley.

Passed Assistant Surgeon Rupert Blue, P.H.&M.H.S., ordered from temporary duty in San Francisco to the Bureau at Washington and assigned to temporary duty in connection with the sanitary inspection of public buildings and workshops at Washington, D. C.

Lieutenant Perry L. Boyer, U.S.A., left Oakland, Cal., with 2nd Squadron, 1st Cavalry, to rejoin station at Fort Sam Houston.

Assistant Surgeon H. L. Brown, U.S.N., ordered from the *Texas* home to wait orders

Passed Assistant Surgeon E. M. Brown, U.S.N., ordered from the New York Naval Hospital to the Canal Zone.

Dr. Ira C. Brown, U.S.A., ordered to accompany battalion of infantry from Fort Niobrara to Fort McIntosh, and to duty at that post.

Dr. John L. Burkhart, U.S.A., ordered from the Philippines, August 1.

Dr. Caspar R. Byars, U.S.A., ordered from Jefferson Barracks to the Arcadia Rifle Range for the target practice season.

Assistant Surgeon F. E. Campbell, U.S.N., ordered to the *Constellation* with additional duty at the Newport Naval Training Station.

Dr. George F. Campbell, U.S.A., ordered from Wheatland, Wyo., to the Philippines.

Acting Assistant Surgeon R. A. Campbell, U.S.N., ordered from the Cincinnati Naval Recruiting Station to the Midway Islands.

Surgeon D. N. Carpenter, U.S.N., ordered from the Puget Sound Naval Hospital to the Asiatic Station.

Dr. William E. Cass, U.S.A., returned from San Francisco to Vancouver Barracks.

Surgeon F. J. B. Cordeiro, U.S.N., retired from active service May 9, 1906.

Surgeon H. C. Curl, U.S.N., commissioned Surgeon with the rank of Lieutenant Commander from December 16, 1905.

Acting Assistant Surgeon E. E. Curtis, U.S.N., ordered from the *Franklin* to Camp Harrington, Williamsburg, Va.

Captain Carl R. Darnall, U.S.A., ordered before the Washington Promotion Board for examination.

Surgeon C. J. Decker, U.S.N., ordered from the *Alabama* home to wait orders.

Surgeon J. B. Dennis, U.S.N., ordered from the Indian Head Naval Proving Ground to the Puget Sound Naval Hospital.

Surgeon C. M. De Valin, U.S.N., ordered from the Baltimore Naval Recruiting Station to the *Alabama*.

Acting Assistant Surgeon H. L. Dollard, U.S.N., appointed May 26, 1906.

Medical Inspector N. H. Drake, U.S.N., ordered from the Naval Academy to the New York Naval Hospital for treatment.

Captain B. H. Dutcher, U.S.A., ordered before the Washington Promotion Board for examination.

Captain Douglas F. Duval, U.S.A., ordered from Fort Williams to Fort Snelling.

Assistant Surgeon H. G. Ebert, P.H. & M.H.S., ordered from special temporary duty in San Francisco to rejoin station in Seattle, and thence to the United States revenue cutter *Perry*.

Surgeon J. M. Edgar, U.S.N., ordered home from the *Monadnock*.

Lieutenant George M. Ekwurzel, U.S.A., ordered from West Point to the Washington Barracks General Hospital, and thence to temporary duty at Fort Hamilton.

Surgeon A. Farenholt, U.S.N., ordered to the *Independence*.

Captain P. C. Fauntleroy, U.S.A., ordered before the Washington Promotion Board for examination.

Assistant Surgeon W. H. Frost, P.H.&M.H.S., ordered from Baltimore to the United States practice ship *Chase*.

Captain L. A. Fuller, U.S.A., ordered before the Presidio Promotion Board for examination, and from Fort Clark to the Fort Leavenworth Military prison.

Dr. Fletcher Gardner, U.S.A., ordered from Fort Mansfield home for annulment of contract.

Assistant Surgeon A. J. Geiger, U.S.N., ordered from the Naval Medical School to examination for promotion, and then to wait orders.

Captain James Andrew Gilmour, Ph.B.(Yale) 1895, M.D.,(Columbia) 1899, has been appointed Assistant Surgeon of the 13th Heavy Artillery, N.G.N.Y.

Major James D. Glennan, U.S.A., appointed member of the West Point Examining Board for 1906.

Acting Assistant Surgeon R. H. Gray, P.H.&M.H.S., granted one month's leave.

Lieutenant Colonel William W. Gray, U.S.A., on sick leave from the Headquarters Department of the Gulf.

Lieutenant Jay W. Grissinger, U.S.A., ordered from Fort Jay to Fort Warren.

Passed Assistant Surgeon S. B. Grubbs, P.H.&M.H.S., ordered for temporary duty at Cleveland, Ohio.

Assistant Surgeon M. C. Guthrie, P.H.&M.H.S., ordered from Ellis Island to Havana, Cuba,

Major H. M. Hallock, U.S.A., granted two months extension of sick leave.

Colonel P. F. Harvey, U.S.A., relieved from station at Governor's Island and assigned to New York City in connection with his duties as Chief Surgeon Department of the East.

Assistant Surgeon J. P. Haynes, U.S.N., ordered to the Washington Naval Hospital.

Dr. John R. Hicks, U.S.A., granted one month's sick leave.

Dr. David D. Hogan, U.S. A., granted one month's extension of leave.

Passed Assistant Surgeon J. H. Iden, U.S.N., ordered from the Newport Naval Hospital to the *Columbia*.

Surgeon Fairfax Irwin, P.H.&M.H.S., granted two months leave.

Assistant Surgeon B. F. Jenness, U.S.N., ordered from the Naval Medical School to the *Constellation*, with additional duty at the Newport Naval Training Station.

Acting Assistant Surgeon William F. Jones, P.H.&M.H.S., granted one month's leave.

Dr. John P. Kelley, U.S.A., returned from San Francisco to the Presidio of Monterey, and ordered from the Presidio of Monterey to Sequoia National Park.

Surgeon D. B. Kerr, U.S.N., ordered from the Naval Medical School to the Chicago Naval Recruiting Station.

Assistant Surgeon General J. W. Kerr, P.H.&M.H.S., delegated to the meeting of the National Association for the Study and Prevention of Tuberculosis.

Captain Thomas J. Kilpatrick, U.S.A., ordered from Fort Moultrie to Fort McPherson for temporary duty.

Surgeon C. P. Kindleberger, U.S.N., ordered from the *Independence* to the Asiatic Station.

Lieutenant R. M. Kirby-Smith, U.S.A., ordered home from the Philippines, August 1, 1906.

Major John S. Kulp, U.S.A., promoted from Captain, May 26, 1906.

Surgeon C. D. Langhorn, U.S.N., ordered from the Naval Medical School to temporary duty at the Naval Academy, and thence home to wait orders.

Assistant Surgeon A. E. Lee, U.S.N., appointed with rank of Lieutenant (j. g.) May 9, 1906.

Lieutenant William L. Little, U.S.A., ordered from Fort Sam Houston for temporary duty at Fort Sill.

Dr. Francis M. McCallum, U.S.A., returned to Fort D. A. Russell from leave.

Assistant Surgeon G. H. McConnon, U.S.N., ordered from the *Constellation* to the *Missouri*.

Dr. Fred S. Macy, U.S.A., ordered from Fort Adams to Fort Ethan Allen for temporary duty.

Assistant Surgeon J. D. Manchester, U.S.N., ordered to the Cincinnati Naval Recruiting Station.

Captain Charles E. Marrow, U.S.A., ordered from Fort Monroe to the Washington General Hospital for temporary duty, and then to rejoin station at Fort Monroe.

Surgeon E. H. Marsteller, U.S.N., ordered from the St. Louis Naval Recruiting Station to the Baltimore Naval Recruiting Station.

Assistant Surgeon G. M. Mayers, U.S.N., ordered from the Naval Medical School to examination for promotion, then to wait orders, and to the Washington Navy Yard.

Assistant Surgeon R. H. Michels, U.S.N., ordered from the Naval Medical School to the Kansas City Naval Recruiting Station.

Assistant Surgeon James Miller, Jr., U.S.N., died on May 13th at Midway Islands.

Passed Assistant Surgeon Dunlop Moore, P.H.&M.H.S., granted two months leave.

Passed Assistant Surgeon J. H. Moore, U.S.N., ordered from the Naval Medical School to examination for promotion, and then to wait orders.

Assistant Surgeon F. M. Munson, U.S.N., ordered from the Naval Medical School to the Indian Head Naval Proving Ground.

Surgeon F. S. Nash, U.S.N., ordered from the *Rainbow* to the *Monadnock*.

Passed Assistant Surgeon J. A. Nydegger, P.H.&M.H.S., granted three months leave with permission to go beyond the sea.

Passed Assistant Surgeon J. H. Oakley, P.H.&M.H.S., ordered from temporary duty at San Francisco to rejoin station at Port Townsend.

Brigadier General Robert M. O'Reilly, Surgeon General U. S. Army, is representing the Medical Department of the United States forces at the International Red Cross Conference.

Captain Henry Page, U.S.A., ordered from the Fort Leavenworth Military Prison to Fort Clark.

Lieutenant Colonel H. O. Perley, U.S.A., appointed member of West Point Examining Board for 1906.

Medical Director R. C. Persons, U.S.N., ordered from the Norfolk Naval Hospital to the Mare Island Naval Hospital.

Assistant Surgeon Joseph Pettyjohn, P.H. & M.H.S., ordered to the United States revenue cutter *Thetis*.

Surgeon C. Pickrell, U.S.N., ordered to the *Franklin*.

Assistant Surgeon W. S. Pugh, Jr., U.S.N., ordered to the *Lancaster*.

Captain I. W. Rand, U.S.A., ordered before the Presidio Promotion Board for examination.

Dr. James Reagles, U.S.A., returned from Fort Snelling to Fort Keogh.

Assistant Surgeon I. S. K. Reeves, U.S.N., ordered to the Boston Naval Hospital.

Dr. George H. Richardson, U.S.A., appointed Contract Surgeon and assigned to duty at the Presidio of San Francisco.

Lieutenant Chandler P. Robbins, U.S.A., ordered from Fort Ethan Allen to Madison Barracks for temporary duty.

Captain F. F. Russell, U.S.A., appointed member of a medical examining board at the Presidio of San Francisco.

Captain H. H. Rutherford, U.S.A., appointed member of a medical examining board at the Presidio of San Francisco.

Assistant Surgeon C. E. Ryder, U.S.N., ordered from the *Missouri* home to wait orders.

Assistant Surgeon H. Shaw, U.S.N., ordered from the Naval Medical School to the Philadelphia Naval Hospital.

Lieutenant J. R. Shook, U.S.A., granted a month and a half leave of absence.

Assistant Surgeon F. M. Shook, U.S.N., ordered from the Mare Island Naval Hospital to the Mare Island Navy Yard.

Medical Director M. H. Simons, U.S.N., ordered from the Mare Island Naval Hospital to the Philadelphia Naval Hospital.

Captain George A. Skinner, U.S.A., ordered before the Presidio Promotion Board for examination.

Dr. Ernest F. Slater, U.S.A., ordered from Fort Hancock to temporary duty at Fort Hamilton, and return.

Lieutenant William M. Smart, U.S.A. was married in New York City, May 19, 1906, to Miss Catharine B. Lynch.

Surgeon A. C. Smith, P.H.&M.H.S., granted one month's leave.

Dr. Samuel A. Springwater, U.S.A., granted two months leave from San Francisco.

Passed Assistant Surgeon H. A. Stansfield, P.H. & M.H.S., ordered from the Hygienic Laboratory, Washington, to Baltimore.

Medical Inspector J. M. Steele, U.S.N., ordered to the Naval Academy.

Major William Stephenson, U.S.A., appointed member of a medical examining board at the Presidio of San Francisco.

Acting Assistant Surgeon J. W. Stevenson, P.H. & M.H.S., granted three months leave.

Assistant Surgeon A. M. Stimson, P.H.&M.H.S., ordered to Stapleton, N. Y., for temporary duty.

Captain John H. Stone, U.S.A., ordered before the Washington Promotion Board for examination.

Surgeon G. W. Stoner, P.H. & M.H.S., directed to proceed to Great Britain and Europe for special temporary duty and return to Ellis Island.

Medical Director T. H. Streets, U.S.N., ordered from the Philadelphia Naval Hospital to wait orders.

Major Paul F. Straub, U.S.A., appointed member of West Point Examining Board for 1906.

Captain Verge E. Sweazey, U.S.A., ordered from the Washington General Hospital to Fort Williams.

Dr. Charles W. Thorp, U.S.A., granted three months leave from Fort Ethan Allen.

Passed Assistant Surgeon J. P. Traynor, U.S.N., ordered to the Portsmouth Naval Hospital for additional duty.

Acting Assistant Surgeon F. W. Tyree, U.S.N., ordered from the Kansas City Naval Recruiting Station home to wait orders.

Surgeon C. C. von Wedekind, U.S.N., ordered from the Chicago Naval Recruiting Station to wait orders.

Dr. Victor E. Watkins, U.S.A., ordered to Fort Mansfield for temporary duty.

Passed Assistant Surgeon U. R. Webb, U.S.N., ordered from the Naval Medical School to the Portsmouth Naval Hospital.

Dr. W. A. Weldon, P.H. & M.H.S., granted one month's leave.

Dr. Francis M. Wells, U.S.A., ordered from Fort Niagara to Fort Robinson.

Dr. Clark I. Wertenbaker, U.S.A., returned to Madison Barracks from leave.

Lieutenant E. R. Whitmore, U.S.A., ordered to Fort Jay instead of to Fort Warren.

Surgeon H. D. Wilson, U.S.N., ordered from the Portsmouth Naval Hospital to the *Dixie*.

Captain James S. Wilson, U.S.A., ordered before the Washington Promotion Board for examination.

Surgeon L. L. Williams, P.H. & M.H.S., granted one and one-half months leave.

Captain William H. Wilson, U.S.A., ordered before the Washington Promotion Board for examination.

Captain John D. Yost, U.S.A., ordered from Honolulu to the Philippines

SCHOOL OF MILITARY HYGIENE.—A school of Military Hygiene for the instruction of regimental officers and soldiers has been established at Aldershot under the direction of Lieutenant Colonel R. H. Firth, the distinguished professor of Hygiene at the Royal Army Medical College, formerly editor of the *Journal of the Royal Army Medical Corps*. The object of the course is not only to acquaint the officers and men with the elementary principles and laws of hygiene, but to point out at the same time in a simple and practical way the causes of disease in the Army and how best to guard against them.

THE ARMY MEDICAL SCHOOL.—At the final examinations of the Army Medical School the following students were successful, with class standing as follows: Contract Surgeons Albert G. Love, Harold W. Jones, Omar W. Pinkston, Hermon E. Hasseltine, Henry J. Nichols, Matthew A. Reasoner, Oswald F. Henning, Lucius L. Hopwood, Charles E. Freeman, Major Vernon J. Hooper, Mich. N. G., Contract Surgeons Ferdinand Schmitter, Laurence P. Desmond, Henry B. McIntyre, Howard A. Reed and Thomas F. Duhigg. Contract Surgeon John R. Hicks is sick at the Washington General Hospital but will be given a special examination upon his recovery. Contract Surgeon Albert H. Wilton, a member of the class, died last month at the Washington General Hospital from pneumonia.

ARMY MEDICAL EXAMINATIONS.—An examination for appointment in the Army Medical Corps will be held at various military posts throughout the United States on July 31, 1906. Application for permission to appear must be made to the Surgeon General of the Army before June 30, who will furnish full information upon the subject. The age limit of the candidates, it may be remembered, is thirty years.

EXPERIENCES IN THE SAN FRANCISCO DISASTER.—Captain Henry duR. Phelan, formerly Assistant Surgeon of United States Volunteers, and a member of the Association of Military Surgeons, describes his adventures in connection with the San Francisco disaster as follows:

"After escaping from our house uninjured with my family, consisting of myself, wife and two young children, we soon saw it reduced to ashes without having any opportunity of saving anything but what we could carry in our hands.

"In a few hours time we were reduced from a position of comfort to the direst distress. Hatless and half dressed, my wife and babies were driven up the street by the soldiers, and I remained behind in vain endeavor to save some of my property. After dragging, unaided, across the avenue into a vacant lot, several trunks of valuables, and having saved my diploma, I fell from exhaustion with my hands blistered and my throat burned, and was rescued by soldiers and friends who laid me out on the sidewalk and administered a heart tonic, which revived me.

"While I laid thus prostrated, I felt several more shocks of earthquake and saw my house disappear completely and the effects I had saved with such difficulty consumed in the street.

"I was fortunate after a separation of four hours, in finding my family in the crowd which had been driven back several blocks, and together, we wandered about the streets and over the hills for several days and nights, with scarcely any food or shelter against the weather. A kind hearted policeman finally took us into his half wrecked cottage, whence we were directed to a house on 24th street, where we occupied a vacant room and slept upon the floor.

"After standing in line for hours for our bread and a few other necessities, day after day, week after week, we finally obtained two army mattresses and blankets and enjoyed a degree of comfort after our painful experience on the hills.

"To any but a dreamer, the prospects of hundreds of physicians in San Francisco of getting on their feet again are very poor. Their practice is gone, as well as their offices, and also the homes of many. My losses cannot be estimated in money alone. and the things that I most prized can never be replaced.

"I lost all my army relics, including my commission, sword, and my certificate of membership in the Association of Military Surgeons."

Current Literature.

THE SUBCONSCIOUS.*

THE action of the subconscious mind, much more active in some persons than in others, is a particularly important feature in mental and nervous pathology, and also in medical psychology. We have lacked hitherto a scientific work upon the subject, and welcome with particular pleasure the valuable treatise of Prof. Jastrow. He considers the subject in three parts, Normal, Abnormal, and Theoretical, taking up in each section the features of the subject properly pertaining to them. The work is written in an attractive and conversational style, and is a most entertaining as well as an exceedingly instructive work.

INTERNATIONAL CLINICS.†

THE first volume of the sixteenth series of International Clinics in addition to a valuable series of articles on Treatment, Medicine and Surgery, contains an excellent resumé of the progress of medicine during 1905, divided into the departments mentioned, and continues to favorably represent the highest class of professional work.

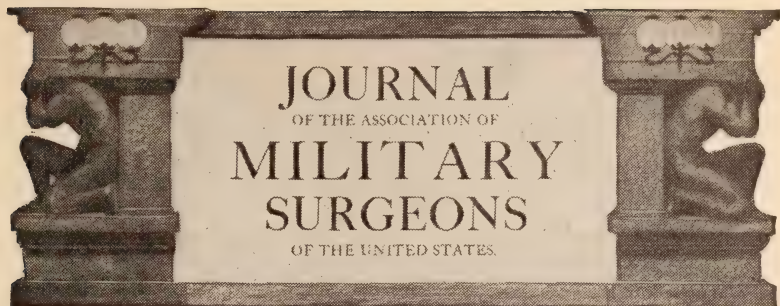
MANUAL OF URINE ANALYSIS.‡

THIS is a comprehensive and well developed treatise upon the kidney secretion, prepared by a distinguished pharmacist of the Italian naval medical service. The instructions are clear, explicit and complete. The ground is thoroughly covered and the book is well adapted to naval purposes.

***The Subconscious.** By Prof. JOSEPH JASTROW. Small 8vo; pp. 543. Boston and New York, Houghton, Mifflin & Co., 1906.

†**International Clinics.** Edited by A. O. J. KELLY, M.D. *Sixteenth Series*, Vol. I. 8vo; pp. 310, with 50 illustrations. Philadelphia and London, J. B. Lippincott Co., 1906.

‡**Manuale per l'Analisi dell' Urina ad uso degli Studenti, Farmacisti e Medici pratici**, pel Cav. LUCIANO SALINAS. 8vo; pp. 212, with numerous illustrations and colored plates. Napoli, Tipografia Angelo Trani, 1905.



Original Memoirs.

MEDICO-MILITARY NOTES IN MANCHURIA.*

By COLONEL JOHN VAN RENSSELAER HOFF, A.M., M.D.
ASSISTANT SURGEON GENERAL, IN THE UNITED STATES ARMY; MILITARY OBSERVER WITH THE RUSSIAN FORCES IN THE FAR EAST, 1905.



THE Russo-Japanese conflict of 1904-05 has become a matter of history. With its causes, conduct, and political, sociological or militant results we, as physicians, are not concerned, but as such, we are immediately interested in its military sanitary conditions, management and outcome, while remotely, these can but deeply concern us in their application to our own military circumstances—

The remarkable sanitary results achieved by the belligerents in Manchuria have taught the world—

1st. That there is no legitimate reason why in war the mortality from disease should exceed that from traumata.

2nd. That the extraordinarily large excess of deaths from

*Presented to the American Surgical Association, Cleveland, O., 1906.

battlefield injuries over those from disease, obtained for the first time in history, is directly due to the observance of well established hygienic rules, proper sanitary organization, sufficient *personnel* and adequate *matériel*, not to mention persistent fighting.

3rd. That so far as known, to me, this war has developed nothing new in medical treatment or surgical technique, its one lesson for us is summed up in a single word, "*prevention.*"

Without delving too deeply into statistics and burdening you with a mass of figures, I will here simply epitomize the Official Medical reports so far as known to the Russian military authorities at the date they were given to me in Harbin, October 2nd, 1905.

From the beginning of hostilities, February 10th, 1904, to September 1st, 1905, the hospital records account for 352,412 cases, exclusive of the killed, and missing; and of the Port Arthur statistics then unknown to the Russian authorities.

Of these cases—

		of Disease.	of Wounds.
8,983	Died {	In Hospital.....4790.....	3008
		In Quarters..... 652.....	533
24,255	Were Discharged for Disability.		
120,394	Were Transferred West of Baikal.		
173,645	Recovered and		
25,135	Remained Under Treatment.		
<hr/>			
352,412			

The question will naturally be asked what was the death rate among the 120,394 "transferred" cases? I can only answer this by saying that in consultation with the statistical officer on September 18, 1905, he informed me that the total number of deaths from disease was then 18,830.

The foregoing table accounts for but 5,442 so we must assume, if my information and notes are correct, that 13,388 of the "transferred" cases died of disease. I have nothing to indicate how many of them, if any, died of wounds.

In other tables furnished me at the same time there are noted 180,682 additional cases of battlefield casualties of which there were—

19,467	Killed
121,486	Wounded
39,729	Missing

180,682

Combining the two tables we have 533,094 cases of which—

18,830	Died of Disease
3,541	Died of Wounds
19,467	Were killed in battle
39,729	Missing

81,567

The factor of the “missing” is a very large one in the problem of proportional losses.

The number of reported “missing” is extraordinary, nearly twice as great as the identified killed and five-fold more than the Japanese reported “missing.” In the German Army during the Franco-Prussian War the proportion of the “missing” to “wounded” was about one to five, whereas the Russians reported one to three.

When the circumstances of the conflict in the Far East are considered it will be seen that the Russians were driven from every battlefield and compelled to abandon their dead, which, in the absence of specific information as to death, they could but carry as “missing.” It is not conceivable that many, if any, Russian deserted, as there was no place to desert to except the enemy, in which event they would have been reported, at least by name, to their own authorities as in the case of other prisoners. So it would not be unreasonable to count all the missing as dead, which would give—

62,737	Dead from battle casualties to
18,830	from Disease or—

3.3 killed to 1 death from morbidic causes. It would, however, bring us well within the bounds of probability if we applied the German results to the proportion between the Russian killed and missing, 1 to 1.5, which would give approximately—

37,642	Killed and
25,095	Missing or—

almost exactly two killed to one dead from disease, which at least until the statistics are crystallized, may be accepted as the probable ratio.

This gives approximately—

.62 Missing to
.95 Killed to
3.00 Wounded—

which closely approaches the German ratio of—

.54 Missing
.75 Killed and
2.83 Wounded

It is not probable that the Port Arthur statistics will affect this proportion, except as to "missing," of which there should have been but few, nor are they likely to change the relation between the number dead of disease and that from violence.

As the population is an essential factor in determining the rate of mortality I will give such information as was obtainable during my tour in the Far East, it being understood that until peace was finally concluded no secrets were more jealously guarded than those which might in any way convey to the enemy the strength of the opposing forces.

Kuropatkin, who immediately preceded the outbreak of hostilities was Minister of War and certainly had every opportunity to know the facts, stated explicitly that Russia was wholly unprepared for war, and in fact at the time the Japanese made the naval attack at Port Arthur "instead of concentrating troops we [the Russians] were actually removing them hence." I have been informed that at the beginning of hostilities there were in the Far East less than a hundred thousand Russian soldiers. We know that the theater of operations was nearly six thousand miles from Russia and that the single track railroad connecting them was not completed and incapable of delivering more than two and a half trains daily. I quote further from Kuropatkin: "In spite of our [Russian] apparent superiority in number of battalions we were numerically inferior to the enemy. Thus at Liao Yang we had altogether 135,000 bayonets, at Sha-ho 145,000 bayonets and at Mukden between 275,000 and 290,000 bayonets."

Add to these figures sixteen per cent to cover the other fighting arms and we find that the Russian forces numbered at—

Liao Yang.....	156,000
Sha-ho.....	168,200 and
Mukden.....	336,400

After their retreat from Mukden there remained in the Far East altogether hardly 300,000 Russians. In the meantime the Military Mill at home had begun to grind rapidly, the railroad was completed and its capacity multiplied, and the mobilizing machine finally worked smoothly so that in August the combatant strength reached 870,000 and when peace was declared the Russians actually had 1,132,000 men east of Baikal.

The total number of the Russian military population may be estimated as follows:

1,132,000	Present when war closed
18,830	Dead from disease
3,541	Dead in hospital and quarters from wounds
19,467	Killed in battle
39,729	Missing
60,000	Taken prisoners, (estimated)
80,283	Returned to Russia after deducting $\frac{1}{3}$ sent back
24,255	Discharged for disability

1,378,105

Add to this the strength of the Port Arthur garrison and it will be seen that the total Russian military population in the Far East numbered approximately 1,400,000 men giving a mortality from disease of 13.4 and from wounds including part of missing of 26.8 per thousand.

The scope of this paper does not permit of any detailed account of the sanitary organization, *personnel* or *matériel* of the Russian Armies in this war; very important matters which cut no inconsiderable figures in determining the excellent sanitary results, so I shall at once proceed to the consideration of the morbid and traumatic circumstances of the campaign.

SPECIAL DISEASES.

It goes without saying that the time for a decisive discussion of the sanitary statistics of the war in Manchuria has not yet arrived. It took a number of years for the statistics of our civil

war to crystallize into their present form, and we must expect this to be the case with the statistics of the Russian and Japanese Armies in the war of 1904-5. General Kuropatkin himself stated six months after Mukden that he did not then know whether he had 275,000 or 290,000 bayonets at that battle. I find by reference to my notes that on July 29—August 11, 1905, the following telegraphic report was sent to the Emperor:

	Officers.	Men.	Total.
Sick.....	975	24,004	24,979
Wounded.....	52	1,313	1,365
Grand total...	26,344

Of the cases under treatment within the theater of war on that date—

- 1,151 had Typhoid fever.
- 22 had Typhus fever.
- 418 had Dysentery.
- 2 had Anthrax.
- 21 had Variola.
- 233 had Scurvy.

From the beginning of the war up to July 1st—14th, 1905, there had been under treatment—

- 10,449 cases of typhoid fever of which 1,041 died.
- 201 " of typhus fever of which 35 "
- 170 " of relapsing fever of which 11 "
- 5,456 " of dysentery of which 256 "
- 209 " of variola of which 12 "
- 1,180 " of scurvy of which 10 "
- 11 " of measles of which 1 "

Report of morbidity on August 1st—14th, 1905, handed me by Dr. Gorbacevich, September 5th, 1905, reads as follows:

	Wounded.	Sick.
Officers under treatment.....	38	945
Enlisted men.....	1,116	26,796

The infectious diseases on that day were:

Dysentery.....	677
Dysentery, Pseudo-(?)	181
Gastro-enteritis (epidemic)	299
Typhoid fever.....	2,709
Typhus fever.....	19
Grippe.....	1,013
Relapsing fever.....	9
Malarial fever (intermittent).....	473
Anthrax ..	3
Erysipelas.....	71
Scurvy.....	281
Measles.....	3
Small pox.....	21

5,759

This report does not seem to agree with that sent to the Emperor.

MORBIDITY AMONG THE RUSSIANS IN THE FAR EAST.

On August 31st—September 13th, 1905, there were—

	Officers.	Men.	Total.
Sick	1,024	23,489	24,513
Wounded.....	30	592	622
	25,135

Of which—

- 5,287 had typhoid fever.
- 646 had dysentery.
- 40 had typhus fever.
- 1,089 had grippe.
- 559 had malarial fever.
- 1 had anthrax.
- 41 had erysipelas.
- 104 had scurvy.
- 4 had small pox.
- 4 had measles.

From the foregoing it will be seen that the morbidity experience of the Russian Armies in the Far East has been different in certain important particulars from that in recent wars. There was

to be sure typhoid fever and dysentery in not inconsiderable amount but malaria cut very little figure, while mumps and measles which we always look for, practically failed to appear. There was a considerable amount of scurvy, probably much more than is of record, and venereal was of little moment. In fact the comparatively small number of deaths from disease (18,830) indicate a state of healthfulness unequalled in military history. The question naturally arises as to why this was so, and this I will endeavor to explain.

The Russian peasant who reaches the age of maturity, is the survival of the fittest, for the conditions of his life from the beginning are such as only the strongest can endure. Huddled together with the rest of his probably large family, in ill constructed and unventilated habitations, poorly fed and worse clad, the child grows up in an atmosphere of privation, is subjected to all of the diseases of infancy, endures the rigors of a harsh climate, and survives only because of his own intrinsic resisting powers.

Owing to Russia's enormous population the amount of material available for military purposes is practically unlimited, and from this material she took the best for service in the Far East. Starting in perfect physical trim, the man of the mobilized units traveled slowly for two months across the Continent of Asia, under constant observation, and frequent critical inspections. So that every man who by any chance might have been suffering from latent infection at the beginning, or who developed such infection en route, was at once separated from his command. Thus it was that the troops reached the theater of operations free from infection and in good condition to resist the morbid influences they would necessarily be subjected to in active service.

Of the climate of Manchuria little need be said here. That part of the country I saw (Harbin region) reminded me of our own northern Mississippi Valley in many respects,—soil, vegetation, temperature, streams, etc. The summer is comparatively short and there are many warm days, while the winter is correspondingly long and cold the mercury lingering around zero, and often falling much below it in January and February. In July and August is the rainy season during which there are at

least daily showers, and often continuous downpours the result of which is that the whole country goes into solution. The snowfall is light and does not remain on the ground for any length of time being blown away by the wind or vaporized by the sun.

I was told that the prevalent diseases among the natives are typhoid fever, dysentery and smallpox. In 1899 bubonic plague appeared in Newchwang but was confined to that region. I heard of but one outbreak of plague within the Russian lines during my sojourn in Manchuria. This occurred at Dgai-lai-noir a station on the railroad not far from the border, September 22nd, 1905, just before I started for home, and seems to have been accepted by the authorities as veritable plague. The disease was apparently confined to one family, eleven of which died. As strict quarantine precautions were at once instituted I presume there was no extension of the infection, though I left the country before this could be determined. In 1902 a quite severe epidemic of cholera began at Vladivostok and reached westward to Harbin, but no cases of the disease were reported while I was in the Far East.

It is important to add that there are but few mosquitoes and, those I saw, belonged to the *Culex* group. During the rainy season the common house fly swarmed in countless numbers, and I was forced to protect myself from their nightly attacks by using my mosquito bar.

The conditions of the campaign in Manchuria until after the battle of Mukden (March 1905) were such as to demand frequent changes of camping grounds, there being at least one battle monthly, so that before Mukden the army was not exposed to great danger from soil pollution. During the Russian occupation of Mukden and subsequent thereto until May, 1905, the troops were for the most part quartered in "dugouts."

The army ration is adequate and well balanced, but much of the time all its components were not obtainable. During the winter, I was told, vegetables were scarce, and the dietary was largely meat, bread and tea.

The Russian food habits and method of cooking are ideal from a military standpoint. Everything except the bread is

boiled, and is thus not only thoroughly sterilized, but is placed in the best possible condition for assimilation. Moreover the universal use of soup and tea reduced the demand for raw water to a minimum and largely eliminated the probability of infection from this source. The Russians though constantly driven back were not demoralized. Attacked furiously and persistently by overwhelming numbers this army was never captured, and was always quite as ready to fight, though not until the last so well prepared, as was its adversary. So the moral effects of persistent defeat cut little or no figure in the mortality bills.

From the foregoing outline of sanitary conditions obtaining among the Russian forces it would have been easily possible to predict what the sanitary results must be.

Typhoid and bacillary dysentery were endemic in Manchuria and these diseases were bound to appear in the army with greater or less virulency, even though the troops arrived in perfect health and as a rule lived rationally. I say "bound" because these infections were wide-spread and under the conditions of military life could not be wholly avoided. The question for us is, was the best done that the conditions permitted?

In attempting to answer this I will briefly consider the etiology, prognosis, and results of some of the diseases specified, especially of typhoid fever and dysentery.

I think that in the light of present experience we are justified in believing that certain factors of dissemination of typhoid infection cut a much larger figure in camp typhoid than in house typhoid. Based upon the report of the Board appointed to investigate the typhoid epidemic in our camps of mobilization in 1898, there seems to be little doubt that flies and personal contact were the important factors in spreading the germs, while water was secondary or even negligible. This conclusion which was certainly revolutionary, and, I believe, is largely justified by the evidence, is accepted by us more freely than abroad where fly and personal convection are not so seriously regarded.

In discussing the causes of typhoid in the Russian Camps Dr. Gorbacevich, Chief Medical Inspector, stated his views to me as follows:

1st. The fouling of the surface of the ground by infected excrements.

2nd. Constant employment of men in the trenches (Soiling with earth and exhaustion).



Dr. Erast Felitzianovich Gorbacevich, Chief Medical Inspector in the Field on the Staff of the Commander in Chief of the Russian Forces in Manchuria.

3rd. Impossibility of personal cleanliness in camp during the rainy season, which is the typhoid season among the natives.

4th. Crowded state of the military population in camp, and the unaccustomed conditions of military life.

5th. The infection of drinking water by surface washing, especially during the rainy season.

Dr. Gorbacevich further stated as his opinion, that flies had nothing to do with the spread of typhoid fever in the armies of the Far East, though they were an important factor in spreading dysentery and anthrax.

He further said that typhoid fever is epidemic in Russia during cool weather, reaching its maximum in October and November, and thereafter diminishing until February, when it disappears. This is the rainy season in Southern Russia, *but there are no flies*. In Northern Russia the epidemic disappears with the coming of snow. All the Russian physicians with whom I conversed on this subject agreed with the views expressed by Dr. Gorbacevich.

Nothing is more certain than that typhoid fever is a water borne disease and, I think, that we are perfectly justified in believing that infected water is the chief cause of typhoid fever in *house dwellers*, for they have no open sinks and flies are excluded. But with *tent dwellers* the conditions are different, for in military camps the population is dense, the sinks open, personal cleanliness and camp police often indifferent, infection almost always present, and during the beginning of the typhoid season, flies always abundant. Here the man and the fly are the disseminators of typhoid fever.

Before considering several of the facts regarding typhoid fever as seen in Manchuria, I will briefly state what seem to be the accepted views of the medical profession on the *role* of the fly in disseminating the bacillus typhosus. The report above referred to, of the Board on typhoid fever in our Camps of mobilization, 1898, of which disease the Board states that there were over 20,000 cases and a mortality of 7 per cent, indicates that water played an unimportant part, but that the infection was carried by flies, dust and personal contact.

Veeder asserts his belief that flies are the chief factor in transmitting infection during the autumn, the period of most pronounced activity of the disease, a conclusion reached from an investigation to determine the origin of a local epidemic. Inter-

esting experiments were instituted by Ficker to determine if flies could be infected by feeding on typhoid cultures, how the bacilli acted within the insects, if flies could transmit the infection to human beings, and if so for how long a period. The conclusions reached were that the common house fly could eat the typhoid bacillus without danger to itself and that it could transmit the infection for a period of twenty-three days. The bacilli were found in the head, wings, and legs on the fifth day and in the intestines on the ninth day after the ingestion of the infected material.

That personal contact cuts a considerable figure in the transmission of typhoid fever is shown by the investigation of Tolayvoch who reports that between 1881-1899, 6.3 per cent of the cases of typhoid fever occurring in the German Army were hospital infections.

It must not be inferred from the foregoing that I am inclined to disregard the importance of water as a cause of typhoid infection. This has long passed the period of surmise and has become universally accepted. Certainly in the light of experience no military sanitarian can ignore the pernicious effects of the average raw water. Indeed I have contended that the use of boiled water should be as much a part of military routine as the use of boiled potatoes, or any other cooked food. In campaign our only safety lies in regarding all water as infected. This involves the training of our soldiers to use boiled water at all times, and the constant employment of some sterilizing apparatus with a personnel to properly care for it. The extra work and cost involved would be amply repaid by the decreased noneffectiveness from water borne diseases.

I believe the campaign in the Far East fully sustains the position heretofore taken by military sanitarians regarding camp typhoid, and it certainly shows how difficult it is to exclude this disease no matter how favorable the conditions may be.

It has already been shown that the Russian soldier reached the theater of war free from infection and that he campaigned in a country where typhoid fever is endemic. Let us now consider the movement of this disease during the war.

By reference to the table showing the movement of sickness from the beginning to July 1st, 1905, it will be seen that 10,449 cases of typhoid fever had come on sick report of which 1,041 died in Manchuria.

I learned that on July 18th, 1904, there were 100 cases in hospital, of which fifty came from the front; October 26th, 1904, 4,350 cases of which 3,700 came from the front; and on December 31st, 1904, 900 cases of which 800 came from the front.

From January 1st to July 1st, 1905, there was a daily average of 175 cases of typhoid fever on sick report—

July 15th,	1905, there were.....	800 cases.
July 23rd,	" "	1,500 "
August 1st,	" "	2,400 "
August 15th,	" "	3,500 "
August 23rd,	" "	4,400 "
September 1st,	" "	5,287 "

I am indebted to Dr. Gorbacevich for the table on the following page.

On September 16th, 1905, the total number of cases of typhoid fever under treatment was 5,898.

Information from another source was as follows:

Typhoid fever in July, 1905:

	Officers.	Men.
Taken sick.....	136	2,662
Died.....	3	359

Typhoid fever in August, 1905:

Taken sick.....	149	3,884
Died.....	6	672

From the beginning of the war to September 1st, 1905, there were 17,035 cases of typhoid fever of which 2,077 died.

It will be observed that there are considerable discrepancies between the statements of the different authorities as to statistics. Such must be expected and averaged. Statistics take a long time to crystallize, and during the process are constantly changing, though always pointing in the direction of the final permanent form.

TYPHOID FEVER.

DURING AUGUST AND SEPTEMBER, 1905. (INCLUDING LAST WEEK IN JULY).

ARMY.	Period, Week.	Rate per M.*— All diseases.	Actual num- ber of cases of typhoid taken sick.	
1st Army.....	4th week in July, 1905.		234	The rate is based on the strength of the re- spective ar- mies. The three field armies had a combined strength of 729,000.
2nd Army.....			394	
3rd Army.....			166	
Rear Army.....			166	
Preamur District.....			19	
			<u>679</u>	
1st Army.....	1st week in August, 1905.	34.7	180	
2nd Army.....			254	
3rd Army.....			66	
Rear Army.....			123	
Preamur District.....			20	
			<u>643</u>	
1st Army ..	2nd week in August, 1905.	22.2	167	
2nd Army.....			285	
3rd Army.....			157	
Rear Army.....			354	
Preamur District.....			109	
			<u>107</u>	
1st Army.....	3rd week in August, 1905.	17.4	199	
2nd Army.....			193	
3rd Army.....			86	
Rear Army.....			227	
Preamur District.....			51	
			<u>756</u>	
1st Army.....	4th week in August, 1905.	19.2	256	
2nd Army.....			148	
3rd Army.....			132	
Rear Army.....			103	
Preamur District.....			54	
			<u>693</u>	
1st Army.....	1st week in September, 1905.		193	
2nd Army.....			132	
3rd Army.....			73	
Rear Army.....			70	
Preamur District.....			36	
			<u>504</u>	
1st Army.....	2nd week in September, 1905.	* Of the cases under treatment 9.1 per M. were in hos- pital.	82	
2nd Army.....			97	
3rd Army.....			64	
Rear Army.....			55	
Preamur District.....			40	
			<u>388</u>	

There was a steady decrease in the number of cases from the middle of August which it is reasonable to assume continued until the normal endemicity was reached. This decrease was undoubtedly due to the stricter enforcement of sanitary orders, the observance of which had been considerably relaxed. The best evidence of the good results following such enforcement is obtained from our own experience in the Spanish-American War in which the mortality from typhoid was reduced from five per thousand in September to a fraction of one per thousand in December, 1898.



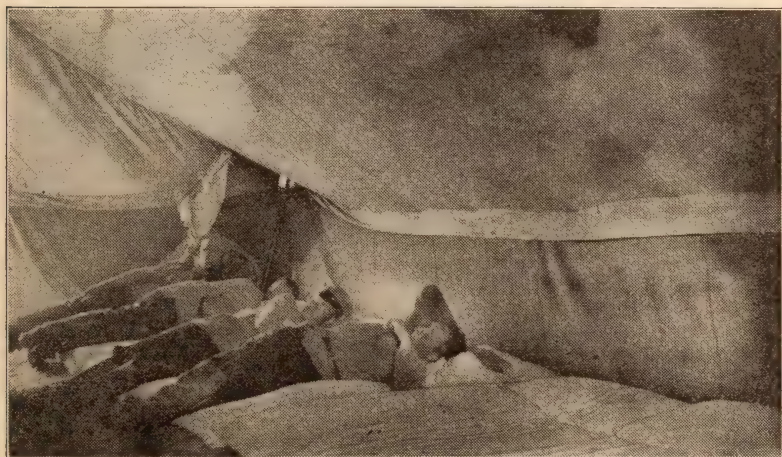
Hospital Tents.

It might be well to here consider some of the individual and collective habits of the Russian soldier, as causative factors in the dissemination of typhoid infection.

I have heretofore stated that the preparation of the ration is ideal from a sanitary standpoint, the food reaching the soldier hot, diluted and with every bit of its nourishment in the best condition for easy assimilation. His favorite beverage, tea, demands the ingestion of a large amount of hot, sterile, and stimulating liquid. His bread is a more likely source of infection, but being made from a flour containing all the elements of the grain

it promotes peristaltic action, and keeps the digestion regular. I look with suspicion on the bread as an inviter of flies, and of hand and mouth infection! This possibility seems to have impressed itself upon the Russian physicians for I observed in the venereal ward of the naval hospital at Vladivostok that every patient was required to keep his ration of bread in an individual bag hung at the head of his bunk, and was not permitted to expose it except at meal time. Here is a note I made August 25th, 1905, at the Etape eating station, Gungalin:

“Contiguous to the bakery are a number of kitchens and



Hospital Tent, Interior.

in the open air many tables at which the men were standing eating their rations in apparent content. I watched the process with interest. On the table in front of a squad were a dish of soup and one of cassia (buckwheat) and scattered around at convenient points hunks of black bread. Each man was provided with a wooden spoon (individual) about the size of a large table-spoon which he dipped indiscriminately into the soup, the cassia and his mouth; chunks of meat carved with a jack knife were eaten from the hand. I did not observe many flies about the tables this morning; but on other occasions have seen them

swarming on the food, the tables, the men and everything in the neighborhood, including the sinks. The possibilities in the spread of typhoid under such conditions are great, especially when the sink habits of the men are considered." I think that this war has demonstrated what is now accepted by us, "that flies are, under active service conditions, among the most important disseminators of the typhoid germ, and that soiled hands cut no small figure."

It will be recalled that the troops had been in the same camps from shortly after Mukden. Until May they had bur-



Barracks Used as a Hospital.

rowed in the ground and thereafter had gone under canvas. The camps soon assumed a state of permanency and were generally well kept to outward appearance.

The Russian soldier's tent is square with a nearly flat or gently sloping roof.

Its dimensions are height to peak 7' 8", to eaves 5' 2". The walls actually measure 6' but with the slope the tent is but about 5' high at the eaves. Its area is 12' x 12', and its maximum occupancy twenty men. The tent is pitched on a center pole and inside at each corner is a corner pole. Ropes sewed into the

canvas of the roof run from the center to the corners. The length of the center pole, which is jointed is 7' 8" and of the corner poles 5' 2". There is a long guy rope at each corner which is secured to a large tent pin 3' long and 3" in diameter. The walls and the roof are separate, the former being suspended from the latter, the space between them serving for ventilation. This is covered by a flap sewed to the roof. The door is at the point where the ends of the wall meet. The shelter tent was in evidence, in fact it was almost universal at the front. This tent is much like our own but instead of being pitched for two, I observed that a squad of six usually combined their shelter halves.



Ward in a Pavilion Hospital.

The most comfortable arrangement I saw was a camp in which the tents were pitched on a turf wall two and a half feet high. Within on either side was a platform of boards separated by a narrow passage way. The platforms and aisles were covered with Chinese matting, and the tents presented a very neat appearance.

This plan of fixed walls was quite generally followed even when shelter tents were used, and there was always an attempt made to get the men off the ground level, even if nothing but an

earthen platform was available. I observed many tents with wicker-work walls, which certainly promoted ventilation.

Some of the tents were so badly worn that *per se* they no longer afforded shelter and all sorts of material, chiefly mud, were used to patch them up, though as a rule they were in good condition.

Of course everything that tended to permanently fix the tent prevented its frequent removal to another site, and the aeration of the occupied ground, so necessary to the healthfulness of the tent dwellers.



Ward in a Semi-permanent Hospital.

The Russian camp latrine, or sink is quite different from those used in other armies, and opens wide its hospitable arms during the typhoid season to the swarms of visiting flies. Some of the different types I saw are shown in the accompanying photos.

I am informed that before the large increase in the number of typhoid cases, very little attention was paid to the regulation which required the construction and use of camp latrines, the soldier preferring a neighboring copse or swale to the uninviting latrine, and I remember to have seen scarcely any vessel for night

urination. I find in a note made at Gungalin, July 28th, 1905, the following: "So far as I have observed in going about here there is very little conservancy of pits and sinks." Later there was a thorough house cleaning, but this did not occur until after the typhoid epidemic had become established. The police of the camp grounds was usually excellent when such was at all practicable. But with mud a foot deep, police of place or person was impossible and the soil and the men soon became mutually toxic. The sink habits of the men regarding personal cleansing, I believe, cut some figure in disseminating typhoid



Camp Latrine.

germs. Paper was scarce in Manchuria. At best newspapers are not very plentiful among the Russians, and the men had nothing to cleanse themselves with except leaves or grass, and not always these, so the cleansing was done, if done at all, with the fingers, which in turn were wiped off on the most convenient thing as there was nothing else to do.

Deep wells (60 to 80 feet) were dug for the use of the troops.

The standing regulations governing the use of water were quite drastic, they read as follows:

"The drinking of raw water is prohibited, except of spring

or well water, free from the possibility of infection, which will be determined by physicians, after consideration of the sources of the spring, and the construction of the well."

"Muddy water containing suspended matter not traceable to its source, must be clarified," etc., etc.

"Water suspected of being pathogenically infected must not only be clarified, but purified by the indicated means."

"The responsibility for the adoption of the means devolves upon the surgeons of the units and hospitals."

The rules given are well known, generally accepted and need



Latrine at an Étape Station.

not be repeated here, though there might well be a constant reiteration of the following regulation: "The best method of sterilizing water is by *boiling* it, and the most practical way to enforce its use is to give it with the tea, which should be done whenever possible. All water used by the men for drinking should be boiled, for which purpose apparatus should be supplied. Water may be considered safe if boiled for 30 minutes, not counting the time consumed in bringing it to the boiling point. Boiled water should not be kept for more than twenty-four hours and must be kept as prescribed in paragraph 172. Interior Economy—

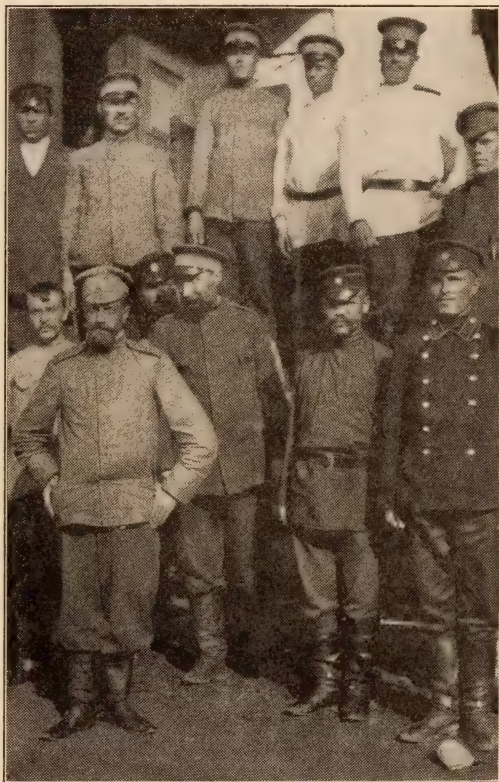
in clean receptacles which must be frequently washed—must be supplied with metal faucets, and tightly covered. The taste of boiled water may be improved by adding citric acid."

The wells I saw were supplied with windlass and bucket, and many of them were under guard.

The Russian peasant is accustomed to a simple life, and the life of the Russian soldier itself simple enough, is a promotion to him. I had it from the Emperor's own lips, that his soldiers in Manchuria were better fed than his peasants at home.

The soldier's material wants were well met and he had little or nothing with which to obtain other than that his Government gave him.

In the Far East everything was under absolute military control, nothing could be



Personnel of a Hospital Train.

brought into the country except by military authority, and consequently little got there in the way of food or drink that could harm the soldier even had he the wherewithal to purchase it. I observed some stores where many necessities and a few luxuries could be purchased at little more than home prices.

These were branches of Army Cooperative Stores in St. Petersburg and Moscow. Cigars and wine in moderation were obtained by officers, but the enlisted man's choice was very limited—tobacco, some sweet crackers, needles, thread, etc. I mention this to show that the Russian soldier was not subjected to the evil influences of the pie and beer vender, not to speak of viler stuff, and his intestinal tract was not thereby rendered inviting to the microbes which are always seeking to destroy him.

I cannot but feel that the Russian authorities placed too much stress on one of a number of causes of typhoid epidemics,



Chief Medical Inspector in the Field, Dr. Erast Felitzianovich Gorbacevich, and Staff, together with Colonel John Van R. Hoff, Military Medical Attaché from the United States. Gun-ga-lin, Manchuria, August, 1905.

and lost sight of others, of equal, indeed greater, importance in camp typhoid. I am told that the Japanese isolated their cases of typhoid as strictly as those of smallpox, and who can question their wisdom in so doing? I know not what their typhoid statistics may be but I am very sure that if isolation was strictly practiced the figures will be comparatively insignificant.

I do not think the necessity for isolation was fully appreciated by the Russians. They certainly sent the typhoid cases out of their camps in large numbers, but I was unable to learn

of any extraordinary effort having been made to search out and isolate suspected cases, which is an important part of prophylaxis. Let us not forget however, that the Russians were, at the time this epidemic appeared, thinking more of the enemy in front of them than that in their midst.

The conditions obtaining in, at least, some of the hospitals I inspected, strongly impressed me with the opinion that the dangerously infectious character of the disease, in its epidemic form, was not appreciated by the hospital authorities. I have only a note here and there of cases of hospital infection, but they occur frequently enough to indicate that such was rife.

The Chief of the Red Cross at one point told me that the type of the disease was severer in 1905 than in 1904, that a Red Cross physician and a nurse had died during the preceding week and that several others were critically ill.

I find the following note (Aug. 25, 1905) illustrative of hospital conditions—

"This afternoon I visited Red Cross Hospital No.—, where there are 120 typhoid cases under treatment, with two or three deaths daily. Typhoid and other cases are treated in the same wards practically, as broad doorways connect all the wards and the doors are constantly open. The windows are without screens, the beds without bars and the flies go as they list. The dejecta are received into bed pans that contain no disinfectant, are covered with a solution of calcium chloride and at once thrown into a privy vault, which is the receptacle of all the kitchen and other wastes from the hospital. This vault is emptied by Chinese labor once weekly. I had a long talk with the head nurse and told her about the dangers of the disease she was treating, regarding which she seemed ignorant though anxious to learn. The well from which is drawn the water used in the hospital, is about fifty feet from the latrine above described. In this hospital several of the personnel have come down with typhoid fever. Apparently no precautions are taken to disinfect linen, dishes, hands, etc."

I later visited Military Hospital No.—, contiguous to the above mentioned Red Cross Hospital. Here one of the physicians

told me that the dejecta are received into a dry bed pan, are disinfected in the pan and thereafter placed in a large receptacle, filled with disinfectant, and there remain for twelve hours. He further told me that all the personnel are required to disinfect the hands after handling patients or infected material, which material is also disinfected. In proof of his statement he showed me his finger nails which were discolored, presumably by the disinfectant. I did not personally see the above described routine. In the physician's opinion the hospital well was infected (though this had not been demonstrated bacteriologically)—as the latrines were on higher ground and seepage therefrom into the well probable. He added that he had no doubt the whole place was thoroughly infected, as last year (1904) the buildings were occupied by Military Hospital No.— which was used as a typhoid hospital. Ten of the personnel had been taken with the disease—five in one week. I observed that the windows were screened, but the doors were hospitably open to the flies, and the patients were not protected by bed nets. It was stated that attempts had been made to protect the patients through the use of veils made from gauze, but they threw them off. Upon the whole I am impressed with the conviction, that any effort made in the hospitals to prevent the spread of typhoid infection, was to say the least, inadequate.

A study of the health conditions at Vladivostok are interesting. This fortress located at the seaport of the same name is considerably south and east of Harbin, though in eastern Siberia. The port is of some importance and there is a civil population of about twenty thousand at present. The strength of the garrison was in 1904, 19,379; in 1905, 66,000, with outlying forces numbering about 35,000 additional.

The water at Vladivostok is bad. There are no water works nor sewer system.

The movement of sickness was as follows:

	1904		1905 (to Sept.)	
	Cases.	Deaths.	Cases.	Deaths.
Typhoid fever.....	132	22	68	4
Scurvy.....	3		425	
Dysentery.....	7		36	3
Grippe.....	223		422	
Syphilis.....	128		215	
Other venereal diseases.....	342		?	
Enteritis.....	204		63	
Diseases of lung and throat, Acute.....	417	21	560	6
Accidents and injuries.....	105	2	321	2
Diseases of the eye.....	61		327	
Diseases of the skin.....	533		?	
Other diseases.....	1754	19	4070	28
Total.....	3970	64	7107	43
Average strength of commands.....	Officers	378		?
(Not including sailors).....	Men	19,000		66,000

During 1904, the following cases were treated in the — Hospital, Vladivostok:

Typhoid fever.....	3
Malarial fever.....	14
Small pox.....	1
Venereal.....	497
Pneumonia.....	19
Insanity.....	4
Tuberculosis.....	23
Wounds.....	151

—with a mortality of eighty. I was not given the statistics for 1905.

In passing through the hospital, I saw a number of cases of typhoid fever scattered throughout the various medical wards, mixed in with other cases. The surgeon told me that they were convalescents. The cases certainly must have been mild as the cards indicated not over three weeks in hospital. I was informed that all cases were confirmed by bacteriological tests. The administration of this hospital was otherwise excellent, and yet here were typhoid cases treated alongside of other diseases, as though contagion was the last thing to be avoided.

As a practical fact, I don't think that the Russians have yet come to realize, that camp typhoid fever is a quarantinable disease.

In glancing back over the foregoing somewhat disconnected story, one is impressed with the fact that the troops in camp, on the lines, were sufferers from typhoid. It cannot be said that

there was overcrowding. The positions covered a front of more than fifty miles, and while they were occupied by over seven hundred thousand men, the camps were not continuous, but the troops were encamped by regiment or even battalion. I did not of course see all the camps, or even a larger part of them, but those I did see were certainly not overcrowded; there was, as a rule, ample space within the camps, and ample surrounding space for organizations.

The men went into camp in May, after a winter in dug-outs, following a series of terrific battles, and with none too much food, indeed it has already been stated that the scorbutic taint prevailed extensively. The question naturally arises as to whether these were the men attacked by typhoid, or were the late comers the victims? So far as I could learn by inquiry of those with whom I could speak, the men longest on the ground were those first attacked. But not when they came out of winter quarters and, presumably, were most debilitated, not during the cold of the spring, but during August three months later. As Dr. Gorbacevich said, during this time they were working in the trenches, but typhoid remained at its minimum until July, when it began to increase. There were two universal conditions in July, which had not before obtained during the year,—rain and flies. According to Dr.—— the camp conservancy had not been good and the surface of the ground surrounding the camps—including the camp wells—was probably infected. We know that dejecta were scattered about on the surface, and we also know that there was some typhoid and some bacillary dysentery among the men. There was, however, no marked increase in the average number of dysentery cases. Regarding the use of raw water the regulations seem to be specific enough, but I fancy were difficult to enforce.

The water, some of it, was analyzed, for every medical chief of a corps had a hygienist and laboratory attached to his staff, and besides these there were three laboratories at Harbin and one at Gungalin, not counting the Botkin railroad laboratories. The Director of the latter told me that he had made thirty water analyses from samples taken about Harbin, as the result of which five wells were condemned and filled up, colon bacilli having

been demonstrated. I got no such definite statement from other laboratories. Dr. Schäffer of the German Army said, so far as he had observed, the soldiers drank when thirsty the water most convenient to get. Moreover during the warmer weather they drank more than usual. It is a fair presumption that in Manchuria all running water is typhoid infected, as typhoid is endemic there. So much for this possible cause of the typhoid epidemic. It has been heretofore stated that the common house fly made its appearance in July, in swarms, and continued until frost came. The sinks were inviting, the fly ubiquitous. How considerable a factor was the fly in this typhoid epidemic? Then too, during the rainy season the men lived in the mud, they could neither keep themselves, their habitations nor their camp grounds clean,—were they factors in spreading the epidemic? If the typhoid bacillus was spread by these means, then why not the Shiga bacillus?

I quote from my notes of September 13th, 1905, made while en route to Vladivostok. "Speaking of the typhoid epidemic which is likely to spoil the splendid health record of the Russian Army, I am impressed with the belief that the following factors enter into it:

1st. The endemicity of the disease in Manchuria and in the Army, many cases occurring every month.

2nd. The depreciation of the health of the Army during the winter in sod-houses, the result of which was a marked scorbutic taint.

3rd. The long continuance in the same camps.

4th. The rainy season which began July 10th and continued through August.

5th. The appearance of flies which occurred in June."

All of the conditions, except the second, are identical with those which appeared in our camps during the Spanish-American War. The advantage with the Russians was that they could get no food other than that issued to them, and no stimulant other than tea.

The epidemic of typhoid in 1905, attacked probably one per cent of the fighting army say seven thousand—for most of the cases came from the front. Of this probably twelve per cent

died, as the infection was more severe in 1905 than in 1904, say 840 men. This is about the same number of cases reported in Philadelphia in 1904. Can a Field Army do better? I think so, but there will have to be a wider dissemination of knowledge of the laws of right living before the white man will do it.

I learned nothing new regarding the treatment of typhoid. There was the same routine of sponging, diet, and watchful care. There were few facilities for tubbing. Soup, always acceptable to the Russian, was the diet, no milk being available, and those who desired it were permitted to eat bread. I heard of no operations for perforation, though frequently asked if such had been done. When I left Manchuria the time had not yet arrived for compiling the detailed statistics of the epidemics, and what is noted here is from the point of view of a hygienist rather than a clinician.

DYSENTERY.

Dysentery has always been recognized as one of the most important causes of noneffectiveness in field armies. It was a veritable scourge to the Russian forces in China during the Boxer uprising. Dr. Gorbacevich told me that the mortality from this disease in that campaign was sixteen per cent of the cases, whereas during the present war it was less than five per cent. The Union Army lost from dysentery during the civil war 24.77 per thousand, or nearly twice the number dead from typhoid fever. Kean quoting from the Medical and Surgical History of the War says: "These disorders [dysentery and diarrhœa] occurred with more frequency and produced more sickness and mortality than any other disease. They made their appearance at the very beginning of the war, not infrequently prevailing in new regiments before their organization was complete, and although as a rule comparatively mild at first, were not long in acquiring a formidable character. Soon no army could move without leaving behind it a host of the victims. They crowded the ambulance trains, the railroad cars, the steamboats. In the general hospitals they were often more numerous than the sick from all other diseases and rivaled the wounded in multitude."

Even as comparatively recent as was the publication of this remarkable work, 1879, there was then but a glimmering of the true causes of this scourge of armies. Lieutenant Colonel J. J. Woodward, Medical Department, U.S.A., its distinguished author, in summing up his classic consideration of the causation of dysentery, says "For myself I strongly incline to adopt the view of the contagion of the stools for a certain class of dysenteric cases, yet I frankly admit the recorded evidence on this head is by no means so conclusive as that which we possess with regard to typhoid fever."

We now know that dysentery, in its various forms, is produced by definite organisms and is infectious. The history of the numberless epidemics in armies, reports of which have been made as far back even as Herodotus, points to this essential fact and yet it was not until 1888 that Chantemesse and Widal first described the bacillus of dysentery, and not until 1898 that Shiga, a Japanese scientist, proved conclusively that the bacillus which bears his name is the true cause of epidemic dysentery.

There is to be sure a so-called tropical dysentery, due to amoeba but of this no case was found among the Russians in Manchuria, and it need not be considered here.

As the *contagium* of dysentery is contained in the dejecta of the sick, and like that of typhoid fever and cholera must be eaten or drank, in other words taken into the intestinal tract, to produce the disease, the conditions under which dysentery becomes epidemic in armies are practically identical with those of typhoid fever, moreover epidemics of dysentery usually occur during the late summer and autumn—coincidentally with those of the typhoid and fly seasons.

As to causation some authors entertain the opinion that water is a less important factor in spreading the Shiga (dysentery) than the Eberth (typhoid) bacillus. This view was undoubtedly entertained by the Russian army physicians who, it will be recalled, attributed typhoid fever in their armies to water infection, and dysentery to fly infection.

As a practical fact, however, the obtainable statistics show but 5,456 cases of dysentery for the period of the war ending

July 1st, 1905, of which 256 died. On August 1st one report shows 418 cases and another 677, with 181 cases of pseudo(?) -dysentery. At no time did the number of cases reach beyond about half the number of typhoid cases, and the mortality was less than half the rate for typhoid fever.

It is interesting to speculate as to why the two diseases did not increase proportionately since the conditions were so favorable to propagation of both.

I find by reference to my notes regarding Military Hospital No.—, Harbin, assigned as the contagious disease hospital, the following under date of August 3rd, 1905: "There are today under treatment thirty-five cases of typhoid, 135 dysentery (epidemic), two varioloid, one diphtheria and twenty-three erysipelas. A considerable number of cases of typhoid have been treated in this hospital during the last sixteen months with a mortality of from five to six per cent.

For the last four months a dysentery (Shiga) serum—manufactured at the Government laboratory, St. Petersburg, has been used with most satisfactory results, so the surgeon states. It was administered in 200 cases received since May last, among which but three deaths occurred, the average mortality, the surgeon said, being four per cent. The dose used was from ten to one hundred grams, hypodermically, in four injections or less daily, the total amount not to exceed one hundred grams. This serum if kept in a cool dry place is efficient for a year. I obtained a sample of it.

There is an excellent laboratory at this hospital, under charge of a professor from the university of Tomsk which seems to be a working institution. I am told that all cases of typhoid are proved by the Widal test. No amœbæ have been found in the stools of any of the dysentery cases."

Except for the serum, the usual routine of treatment was observed in the dysentery cases. Regarding the serum treatment I have not sufficient data upon which to base a conclusion, but it certainly seems most promising, and will bear further investigation, nay demands it so far as we are concerned, for thus far our experience with dysentery has not been happy.

From Kean's table I learn, that during the four years of the Civil War, we had an annual average of 735.96 cases per thousand of diarrhœa and dysentery, with a death rate of 22.91,* and Colonel Woodward writes in the medical and surgical history of that war that, "these disorders occurred with more frequency and produced more sickness and mortality than any other form of disease."

In the list of diseases given at the beginning of this chapter it will be observed that epidemic influenza looms up somewhat prominently. I have no doubt of the existence of this disease in Manchuria, for I had an opportunity to observe several cases of it on the attachés' train. I am quite sure that the diagnosis was often a tentative one, for I was told in the hospitals, that not infrequently cases admitted with this diagnosis subsequently developed well marked typhoid symptoms. Both typhus and relapsing fever were constantly present with the army, though in small numbers. Of the former there were 201 cases up to July 1st, 1905, with a mortality of thirty-five, and of the latter 170 cases of which 11 died. I saw some of these cases in the quarantine hospitals.

Smallpox cut very little figure in the mortality tables, 209 cases of which twelve died. All men who join the Russian Army are vaccinated and this is repeated before starting on a campaign, and thereafter whenever necessary, so there was no reason to expect a severe manifestation of the disease, even though it is endemic among the natives of Manchuria.

The 1,180 cases of scurvy, with ten deaths, probably represent but a small proportion of those more or less affected by the scorbutic taint. I learned from many sources that scurvy modified the course of both medical and surgical cases, and I have actually seen cases of typhoid fever with well marked scorbutic symptoms.

Anthrax was always present in the Army. This was accounted for by the Russian physicians on the hypothesis that the infection came from the sheep skin lining of the overcoats. Anthrax was epizootic in Siberia and might easily have reached the

*Two per thousand less than stated above which was taken from the Medical and Surgical History of the War of the Rebellion.

army, through sheep which were brought from there by the thousand. These cases were treated antiseptically, but all surgical procedure was avoided.

The remarkable absence of mumps and measles will be noted.

I have no record of the total number of cases of pulmonary and cardiac diseases.

The statistics of venereal diseases from the beginning of the war to September 1st, 1905, are as follows:

	1904.	1905.
Syphilis.....	2,867	1,600
Gonorrhoea and chancroid.....	5,756	3,276

The statistical officer estimated that gonorrhoea was to chancroid as two to one.

The total number of insane was 1,081 of which 244 were officers.

I heard of no cases of beri-beri among the Russians.

The foregoing resumé of the morbid conditions and results among the Russians in the Far East, so far as at present known, should afford lively satisfaction to those interested in the welfare of the soldier, both from a humanitarian and a militant standpoint. Russia to be sure had the advantage of the example of our sanitary errors, followed by those of the British in South Africa, and there was no reason why her soldiers and physicians should not have been fully alive to the importance of military sanitation. Then too the people of Russia were stimulated by the widely heralded sanitary work of their adversaries, and spared no effort to produce equally good results in their own armies.

Truly the War in the Far East has taught us many valuable lessons, but none is more valuable than the sanitary lesson of that conflict.

So extended a discussion here, of the morbid circumstances of the campaign in the Far East, is only justified by the lessons we may derive from them and which we, you and I, as military surgeons, may any day be called upon to apply in behalf of our own soldiers.

The traumatic circumstances, the purely surgical conditions, of the campaign would naturally be of great personal interest to

the members of this Society, and at the risk of further trespassing upon your time and patience, I will invite your attention to a few salient features.

The extraordinarily large number of wounded and great mortality from artillery fire, cannot fail to attract attention to the development of this arm. Over twenty per cent of the killed and wounded are chargeable to artillery, more than twice that recorded by the Germans in the war of 1870.

The somewhat sensational reports sent from Manchuria regarding the terrific hand to hand fighting, would lead to the inference, that wounds from "cold steel" must cut no small figure in the casualty tables. As a matter of fact such wounds are practically negligible, less than a total of 2,000 being reported by the Russians.

So far as it is possible to compare the losses of the two contestants, from data now available, which are yet incomplete and consequently unreliable, it appears that, proportionately to the total casualties, the Japanese wounded exceeded the Russians by twelve per cent, while on the other hand the Japanese killed were fourteen per cent less than the Russian.

The fact, if it be a fact, that thirty-three per cent more Japanese wounded died in hospital than did wounded Russians might indicate that the most severely injured among the latter, through the exigencies of war, were *per force* left to die on the field of battle, while the Japanese were able to get practically all of their wounded to hospitals. The latter reported only about 3,000 "missing" while as previously stated, the Russians had nearly 40,000.

I am yet uncertain whether or not there are new lessons for us to learn from this war, regarding the stopping effects of the small caliber high powered projectile.

Is it possible that the 7.60 millimeter cupro-nickel jacketed bullet of the Russians, which weighs 13.7 grams and has an initial velocity of 640 meters (mv.²=561), is more humane than the 6.50 millimeter German silver jacketed bullet of the Japanese, weighing 10.5 grams with an initial velocity of 725 meters

(mv.²=552)? This can apparently be answered in the affirmative, if to kill is considered more humane than to wound, but cannot now be answered conclusively.

A Chief Operating Surgeon writing from Liao-Yang May 31st, 1904, where "most of the wounded passed through my [his] hands" says: "The experience here convinced me that the Japanese rifles are better than ours. The range of this weapon is very great. Within 200 meters, though the track of the bullet is small, the wounds were very fatal owing to the explosive effects there being extensive shattering of bone, or, in the abdomen, tearing of intestines. At longer ranges, 400—800 meters, the wounds were less serious. Except in abdominal lesions the wounds inflicted by the Japanese rifle healed quickly. Even in abdominal cases with severe lacerations of the intestines several patients recovered after suture of the intestines—where asepsis could be maintained. Wounds of the lungs were usually of a less serious nature particularly those received at the higher ranges. Beyond 1,000 meters the bullet disintegrated and the wounds of entrance and exit were usually considerably larger than the channel made by the missile in its course through the tissues, and bones were seldom shattered." The same official is my authority for the statement that at the shorter ranges infection of the wound was infrequent, but at the longer this was more often observed, due, he says, "to the foreign matter, especially clothing driven into the wound." In concluding his report he writes "We can say that the Japanese bullet is modern and humane. About 32 per cent of the wounded were returned to the fighting line inside of one month." Later this authority wrote on the subject of "humane" bullets in a less optimistic frame of mind, as follows: "Fight only during the warm season, before frost; let the battle be on soft ground free from stones or rock, at ranges not less than 250 meters. See that the men go into the fight with empty bowels and bladder and that there be no shooting at heads. If these conditions can be enforced then the bullet so deadly today might prove "humane." Dr. Wreden thinks that the modern jacketed bullet is, under certain conditions, more destructive than the old (large caliber) bullet, and that the

lessened mortality among the wounded is wholly due to improved surgical technique. He says "From the beginning of the war to January 1st, 1905, only one amputation was required in every 200 cases."

The statistics above quoted would indicate that the Japanese bullet is humane, as it was the chief factor in killing outright twenty-nine per cent of all Russians hit, and wounding fifty per cent, of whom but four per cent died. To be killed outright is certainly more humane than to suffer long from painful and disabling wounds.

The Shrapnel bullet is more than twice the caliber of the rifle bullet and with but one sixth its velocity, it is not jacketed and when the projectile bursts the Shrapnel frequently deforms, assuming all sorts of shapes. While the Shrapnel has no hydrodynamic effect it inflicts severe wounds, with great destruction of both hard and soft tissues.

Of Shrapnel Colonel Havard writes, "these shells were much more numerous and did most of the execution." Of the Shimose shell he says "it explodes with great noise on striking the ground, excavating a little crater and giving off a small cloud of thick brown smoke. Except when exploding within a short distance it does but little mischief, for it breaks into a multitude of fragments most of them minute and without much power of penetration."

Has the time yet arrived for us to draw anything more than very general conclusions from the surgical statistics of this War? I think not. I find in looking over my notes numerous entries which give some indications of the direction in which the experience will probably work out. August 16th, 1905, Dr. Brentano of the German Red Cross hospital said that, altogether 600 cases of all kinds had been treated in his hospital. These include 127 surgical operations, of which four were amputations—one shoulder, tetanus, died; one thigh, lower third, shrapnel wound, infected, recovered; one arm, middle third, tetanus, died; one leg (Gritti operation), shrapnel wound, recovered. There were three resections, two of hip and one of wrist, all of which recovered. About ten per cent of the surgical cases died as follows: Four

tetanus, four sepsis, one peritonitis, two meningitis, one empyema, and one rupture of spleen. Only one celiotomy was done for gun shot wound of abdomen with peritonitis, this resulted fatally. Four pelvic abscesses following gun shot wound of abdomen were evacuated per rectum and recovered. No cases of bayonet or saber wounds were received. Dr. Brentano further said that almost all cases of shell and shrapnel wounds arrived infected. In one case (non-infected) a shrapnel bullet penetrated the right lung and was removed from the back. Cases of gun shot wounds from rifle bullets were usually sterile.

Dr. Butts in charge of a Red Cross Hospital at Gotsiadan furnished the following statistics: From ten to twenty per cent of all missiles lodged. Three to four per cent of bullets lodged. All shrapnel wounds were infected and but few bullet wounds. Of fifty cases of infected wounds of head operated upon, one half died, of 150 sterile cases ten per cent died. Dr. Butts is also of the opinion that rest and surgical non-interference are the indications in wounds of the abdomen, fifty per cent of such cases died of peritonitis. He reports five cases of abdominal abscess following wounds, all of which recovered. Among 915 operations, there were seventy-five amputations, fifteen resections, twenty-five excisions, three aneurisms, 200 trepanations.

Dr. Butts treated twenty-four cases of gangrene, of which twenty-three died, and three cases of tetanus all of which died.

Regarding the anatomical location of wounds I have no data of sufficient extent to be of general value. I have heard it stated, casually, that the number of wounds of the head and right upper extremity was unusually large, due to the necessary exposure of these parts in the act of firing, but I have not regarded this as an authenticated statement.

From what I have been able to gather from conversation with Russian Surgeons, I think it probable that we will have no occasion to modify our views regarding the effects of high powered bullets at different ranges. Dr. Wreden writes: "The explosive effects of the Japanese bullet in spongy bone tissue are observed, only at close range—100 meters—beyond which the destruction is slight, but in dense osseous tissue explosive effects are ob-

served up to 800 meters. Within 200 meters wounds of the cranium are generally fatal, the hydrodynamic effects being most marked, and within 100 meters the calvarium is greatly comminuted. Beyond 200 meters tangential wounds of the head are not usually fatal, but penetrating wounds are lethal up to a 100 meters." Dr. Wreden regards wounds of the face and neck as serious, and if the latter are complicated by injuries to arteries, trachea or esophagus they are usually fatal. Colonel Havard reports a wound of the cervical region in the case of Prince Murat, in which the bullet traversed the neck from side to side, coming out close to the internal carotid artery, and another case in which the missile entered at the point of the chin and emerged close to the spine on the right side. Both of these cases were convalescing.

So far as I could ascertain there is a general consensus of opinion that bullet wounds of the lungs are not serious.

The impression left on my mind is that celiotomy for any purpose was a rare operation. This impression was gained, not from statistics—for such were not obtainable except from a single hospital here and there—but from conversation with many surgeons. The only really definite statement I have on the subject is found in a report made by a Chief Operating Surgeon of which I will submit a free translation. "Among the most serious wounds we have encountered are those of the abdomen, in the treatment of which very little has been accomplished. We can only say that the more rest the patient can have from the very moment of the infliction of the wound, the better the result. The character of the missile, bullet, shrapnel, shell or cold steel, is of great importance in determining the result, and lesions caused by each of these should be considered separately. The severity of wounds of the abdominal region caused by the modern bullet is directly proportionate to the range. As the result of the experience gained in several operations done for penetrating gunshot wounds of the abdomen, at close ranges, I was deeply impressed with the great explosive effect of the modern bullet. In some of the cases in which the stomach was full, it was burst into pieces and entirely separated from the surrounding organs. A like re-

sult followed with a full bladder, and great havoc was wrought in liver, spleen and kidneys. In such cases as was to be expected, the symptoms of shock were pronounced and resembled those of internal hemorrhage. The wounded man almost invariably fell to the ground complaining of intense pain in the belly, but did not lose consciousness. If left quiet the pain subsides and the shock disappears." The report adds: "These cases never spoil the statistics of the rear hospitals, for they die on the field or at the dressing station."

"Beyond four hundred meters the explosive effects were not observed, and the patients did not at once fall. Soon however symptoms of shock supervened with vomiting, especially in alcoholics, and the wounded man laid down. This condition usually continued for several days and has led to early operative interference which only resulted unfortunately."

The report estimated the mortality from rifle bullet wounds of the abdomen at forty per cent of such cases. This was based upon nine months experience in the Far East. Shrapnel wounds penetrating the abdomen were much more serious than bullet wounds, the mortality being about eighty per cent; when they involved the liver, spleen and kidneys they caused death quickly from extensive hemorrhage, and in the stomach, intestines or bladder the shrapnel inflicted much severer wounds than the rifle bullet even within the explosive ranges.

Wounds of the abdomen from ricochet bullets or shell splinters, were usually so extensive that surgical interference, even under the best conditions would probably have been ineffective. Such wounds were particularly observed among artillerymen. The external appearance of these wounds differed from that made by the ordinary bullet, the wound of entrance being considerably larger, moreover the course of the bullet was much more irregular. Large pieces of shell sometimes caused immense destruction of tissues, with almost instant death, and yet such cases sometimes recovered.

I have a report on saber, lance and bayonet wounds which I will venture to quote: "The wounds from Cossack lances are large and of the most serious nature, for not only does the point

enter the body but the entire weapon up to the handle,—such wounds are almost inevitably fatal, the wounded dying on the field or en route to the dressing station.”

In considering bayonet wounds a word must be given to the weapon. The Russian bayonet is rapier shaped, it is made for thrusting not cutting, and it inflicts only punctured wounds, the edges of which quickly contract upon withdrawing the weapon.

The Japanese bayonet is a knife, long, strong, pointed and sharp, and with it not only can punctured wounds be inflicted, but incised, contused and lacerated wounds as well. Wounds of the abdomen caused by the Japanese bayonet were generally long gashes, through which the abdominal cavity was emptied of its contents causing speedy death

The Chief Operating Surgeon, above quoted, in summing up his conclusions as to battlefield injuries generally, said that to recommend the doing of laparotomy in a divisional mobile military hospital during the progress of battle, with a constant inflow of wounded, is unwise. “From among several evils the least should be chosen, and time and strength are not available for such operations under such conditions. These abdominal cases should not be operated on but should be given rest, temporary dressing and morphine.”

Finally, he said, active surgical interference in abdominal cases depends upon the temporary location of the wounded, his condition and upon the kind of weapon with which the wound was inflicted. * * * * The result of treatment depends upon the method adopted, and in all such cases absolute rest is essential for at least a week—morphine is our sheet anchor in all wounds of the abdomen.

I heard nothing but praise for the first aid packet which was carried by every officer and enlisted soldier. The officer usually attached the packet to the scabbard of his sword thus assuring its constant presence, for a Russian officer is never without his sword.

The soldier was supposed to have a special pocket in the front of his breeches, on the right side, which was devoted to the first aid packet, but so far as I saw, this rule seemed more honored

in the breach than the observance—though a place was always found for the packet somewhere.

The Russian first aid packet was much like ours in general appearance and size; it contained:

- 1 antiseptic bandage of sublimated gauze; three meters.
- 2 antiseptic compresses sublimated gauze and absorbent cotton.
- 1 safety pin.

These were hermetically sealed in a rubber (water proof) cover, and the package was thus issued for use at the dressing stations, etc.; but when issued to the men, it had an additional cotton drill cover on which was printed a list of contents and the following directions:

- 1. Take off the outer (cloth) cover.
- 2. Open the (rubber) package, take out the compresses and place on the wound—absolutely dry.
- 3. Apply the antiseptic bandage over the compresses—but not too tight.
- 4. Fasten the end of the bandage with the (safety) pin.

NOTICE. In case of a perforating wound, place one of the compresses over each opening.

Of the practical use of the packet, a surgeon wrote that he was much impressed with the care shown in distributing the first aid packet, and the careful way they were carried by officers and men. The first aid bandaging was readily done by the men, though not under strictly aseptic conditions, nevertheless though the heat was great and flies plentiful there was no sign of infection during the first twenty-four hours. The first aid packet proved of invaluable service to the wounded during transportation. Dr. Wreden objected to the red dye in the gauze which he thought occasioned a cutaneous inflammation, aggravated by heat and perspiration. But might not this have come from the sublimate itself? He suggested that the gauze should be soaked in a five-tenths per cent solution of creosote, the especial advantage of which is that it would keep flies away from the dressing.

The first aid packet has passed beyond the experimental stage, and is now universally recognized the world over as a legitimate part of the soldier's field equipment. It has both a positive and a negative value, positive because of its appropriateness and

negative because it prevents the use of an inappropriate dressing, which would surely happen if a proper dressing was not available.

The consensus of opinion among Russian Surgeons, with whom I discussed the matter was that, rifle bullet wounds were usually sterile and wounds from artillery projectiles usually infected. In summer there was much less wound infection than in winter. This is explained by the fact that the body and clothing were more frequently washed in summer, than during the cold season, and that the clothing was lighter and less likely to harbor infection. I find this somewhat startling statement in a report to the Emperor under date of April 15th, 1905. "The last evacuation [Mukden] was carried on in excellent manner, being complicated only by the difficulty in healing the wounded, who suffered from blood poisoning and gangrene, resulting from fur clothing and cold weather." A surgeon told me that after Mukden there were many cases of frost bite, and there was also a peculiar anaemic condition with purpura, which some of the physicians thought was due to the cold which reduced the fibrinogen. I fancy they had not seen much scurvy in their practice, up to that time. Another surgeon told me that after the battle of Sandipas a number of wounded were frozen to death as they lay on the ground.

I inquired of many surgeons if they had used, or seen used, any new or special method of treatment, but none had. Dr. Schäffer of the German Army told me he had not infrequently observed the Russian surgeons painting the surface about wounds with tincture iodine, but he did not learn the special reason therefor.

I could get no exact information as to the percentage of infected wounds that came under treatment.

The surgeons at Irkutsk told me that all the cases they received were infected. By the way, that reminds me I saw six cases of hip joint amputation in one Red Cross Hospital there, all of which were doing well.

Tetanus was not an infrequent complication of wounds. In the surgical clinic at Harbin, through which 7,000 patients had

passed, there were twelve cases of tetanus, of which two recovered. The serum treatment was ineffective.

The statistical officer at Harbin, reported that tetanus was in the proportion of less than two to each thousand of wounded. Of the 250 cases of tetanus, eighty-seven per cent died.

A surgeon said that his largest number of cases of tetanus occurred after Mukden. He got the best results from chloroform and chloral, but nothing from antitoxin.

Erysipelas was always present and it totaled five cases per thousand of wounded.

I believe that the latest surgical procedures were employed in the hospitals in the Far East, though I saw a great many more surgical cases in the wards than in the operating room.

Rubber gloves were not generally used, in fact I think their routine use was only required in the German Red Cross Hospital, though I saw an occasional pair in the Russian hospitals.

Silk was universally used for ligatures and sutures. The Russian surgeons were quite emphatic in their condemnation of animal ligatures in field service, and some of them told me they never used any other than silk ligatures under any circumstances, as there was no certainty of sterility in any other suitable material. Dr. Chervinsky told me that linen thread, treated with celloidin, was quite as good as silk and much cheaper. So far as observed the surgical armamentarium was good. In the beginning of the conflict there were obsolete instruments on hand which, as with us, were thrown in to meet the emergency, and quickly disappeared, to be substituted by modern instruments. Regarding instruments a Russian surgeon wrote: "I am sorry to say that I saw (May 1904) many instruments with bone handles. There was a great shortage of artery forceps and hypodermic syringes. The recently introduced lamps proved of the greatest service, especially after Liao-Yang where we worked three days and nights. This battle not only illustrated the advance made in surgery, but also the great improvement in weapons. We can figure one dead to three wounded."

I have not burdened this paper with an account of the many interesting surgical cases I saw in the Far East, but so far as

possible, have endeavored to deduce lessons for our own guidance, from the general surgical experience of the war.

We learn therefrom that there is no occasion to modify the views, heretofore held, that celiotomy, or indeed any major operation on the field of battle, is interdicted. In such cases expectancy is the correct procedure, and rest and morphine the treatment. The suggestion that we should follow the rule of the ancient warriors, who went to battle in clean raiment and a clean body, is valuable. Add to these an empty stomach and bladder, and there is little left to be done, but trust in Providence. If wounded, keep the wound clean and give nature a chance, at least until a permanent hospital is reached.

MARCHING AND HYGIENE OF THE FOOT.

FOOT-swelling, syndesmitis metatarsæa and the common marching affections do not appear in the nomenclature of Swedish military surgeons, remarks Fr. Klefberg (*Tidskr. i militär Hälsovård*). This is due, the author states, to the fact that the attention of military surgeons has not been awakened to these conditions, an omission which should be corrected. To improve their marching ability the men, the non-commissioned officers and the officers should pay attention to foot hygiene. Printed instructions on the care and dress of the feet should be published and committed to memory by the men. A non-commissioned officer should be required to see that these instructions are carried out and the men who fail to comply with them should be punished. No private shoes and boots should be worn, the regular government issue being required. Those men who are suffering from syndesmitis, etc., should be ordered to bed, but not taken up as ill in quarters. Recruits, who, for any other reason, cannot keep pace with the company, should be subjected to special training under military and medical directions especially adapted to their needs.—HANS DAAE.

THE STATUS OF THE HOSPITAL SHIP IN WAR.

By JOHN C. WISE, M.D.

MEDICAL DIRECTOR IN THE UNITED STATES NAVY; PRESIDENT
OF THE NAVAL MEDICAL SCHOOL.

DURING the month of October 1905 the second Pan-American Sanitary Congress convened at Washington, and the result of its deliberations, was a series of resolutions, to be presented for ratification by their governments, with a view to reducing the disadvantages to commerce, under present quarantine regulations, to a minimum, and the adoption of a system in accord with the modern views of the pathology of yellow fever, Asiatic cholera, and plague.

Although the countries of North and South America are of a civilization as distinct as any in Europe, and the discussions of this Congress were held both in English and Spanish, a remarkable unanimity was apparent, and a successful outcome of the Congress may be confidently predicted. While in this instance, the protection of their respective countries from the ravages of epidemic disease was, doubtless, an important factor in the results obtained, at the same time, a more important instrumentality was a desire to obviate restrictions upon trade and commerce—an agency bearing directly upon financial prosperity.

Unfortunately, in consideration of the subject of this paper, there is no aspect but the purely humanitarian, and this condition is cited to show to those interested in the succor of the unfortunate in war, how persistent and untiring must be the effort if success is to be obtained in the end.

The possible services of the hospital-ship in war were recognized at a period long antedating their adoption. Sir Gilbert Blane, when serving with the English Fleet, operating in the West Indies, in 1741, urged the use of the hospital-ships to relieve the high sick rate, amounting to fourteen per cent. Lind, of the English Naval Service, had similarly recommended, years

before, as nothing affecting the health or welfare of the sailor seems to have escaped his astute mind.

The advantages of a ship, used as a hospital, over temporary or permanent establishments on shore, is a matter which should more seriously engage the attention of the military sanitarian, as the advantages of the floating hospitals are obvious, viz. : First Perfect control of terrain; Second, Adequate supply of distilled water; Third, Facility of sewage disposal.

But it is the purpose here to deal more particularly with the service of the hospital-ship in naval campaigns and during a naval engagement.

What can be done by the hospital-ship during the engagement? and the second more important question, What will it be allowed to do?

The dictum of the Second International Congress, Berlin, 1869, held as follows: "*Les batiments de secours fonctionneront pendant et apres le combat. Ils suivront les flottes belligérantes, et seront aux ordres des Amiraux.*"

Commandant Hovette, de la Marine Francaise, while accepting this proposition in part, positively objects to the constant presence of hospital-ships with the fighting ships, but as the only good reason for this objection could be lack of speed, it can be said here that such objection will lose all significance if the hospital-ship possess a speed equal, if not superior to all others in the fleet. Such speed is a "*sine qua non*," for without it a hospital-ship could not efficiently do the work expected of her, such as quickly transporting the sick of a ship or fleet to the base, or going rapidly to the assistance of a sinking, burning or otherwise disabled vessel.

Despite opinion to the contrary, it is believed that fleets in future campaigns will be accompanied by hospital-ships just as long as the attending conditions will permit, and these ships will be a component of the command, and none other than national ships, as distinguished from those fitted out by private enterprise, will be permitted, the only policy being for the latter to become official, by governmental acceptance and notification thereof to the Powers.

Much has been written on the subject of aid to the wounded in naval warfare from a standpoint extremely humanitarian and too optimistic, and the primal object of antagonizing fleets, the destruction of the adversary, has been lost sight of. The questions proposed, what a hospital-ship can do and what she will be permitted to do, are so closely related that they will best be considered together.

It must be understood that while many Conventions and Congresses have been held to establish what the interests of humanity require in naval engagements, no international agreement has been reached on this subject beyond the extension of the agreements of the Geneva Convention, to include maritime warfare, so that today the greatest desideratum is international consent to a more comprehensive agreement in keeping with the humane views which should prevail as governing armed conflicts between nations. The conclusions reached in conference are of value and will undoubtedly be the basis of final international accord on this subject. We have alluded to the dictum of the Berlin Conference, that hospital-ships should accompany their national fleets in time of war.

It is well to remember that today, at least, a ship-of-war plays the double role of destroyer and saviour, and the rule is that the principles of humanity prevail immediately after the result of an action is decided. In illustration of this may be cited the rescue of the crews of the burning Spanish ships at Santiago de Cuba by the American Admiral Sampson, and more recently, the action in the Sea of Japan, when the ships of the latter country picked up from the sea between 500 and 700 Russian sailors.

As long ago as the International Conference of 1869, it was resolved that the yellow flag hoisted by a vessel which is sinking or burning should be recognized as a signal for assistance, and this position has been held by all authorized assemblies since that time. The services which *can* be rendered by an *official-neutral* during or after an action (the distinction is well made, for it will be remembered that the rescue made by the English Yacht *Greyhound* (?) from the crew of the sinking Confederate ship *Ala-*

bama, after an engagement off Cherbourg, 1864, was the occasion of diplomatic discussion between the governments of England and the United States) must be governed by conditions of the most variable nature. It is most unlikely that aid of a purely professional nature will be rendered until after the close of an action. Rescue work was notably exemplified in the action at Lissa, where the *Re d' Italia* was so seriously injured as to quickly founder, precipitating her complement of 650 men into the sea. Of this number 500 lost their lives by drowning, the remainder being saved by the *Duc de Genova*, also an Italian ship, while the *Archduc Max*, an Austrian, in an effort to assist in the rescue, was seriously damaged when so occupied. This instance fitly illustrates the complexity of such a situation, and the dangers to which a hospital-ship, acting as a rescuer, is exposed, even at the hands of its own flag. When immense humanitarian possibilities conflict, in the judgment of a Commander, in the smallest way, with the scale of victory, humanity will not be considered a moment, and in most instances, such judgment is in the line of duty.

There is great unanimity of opinion that a hospital-ship cannot be permitted to take such position, or act in any manner, which will interfere with the belligerents; if it does not observe this understanding, it practically surrenders its neutrality; if it venture within the range of fire, it is liable, as any other, to suffer the consequences. Thus, it is most likely, as past experience has shown, that the relief rendered to sinking and burning ships will be accomplished by the combatant vessels themselves, as was the case at Lissa and the battle of the Sea of Japan.

We are decidedly of the opinion that there is no place for the hospital-ship during an engagement but to keep well out of the way and in a state of preparation to intervene immediately after the cessation of the combat; this will, undoubtedly, be the rule to which, like all others, there will be exceptions, for instance when a burning or otherwise injured ship is left isolated, or a disabled ship retreats beyond the line of fire—or again, if a hospital-ship be present when ships engage singly.

In this connection the opinion of an eminent German naval

officer, Vice-Admiral Paschen, commands our attention. He says: "Quand serait il permis au vaisseau-hospitalier de commencer son action? Et qui marque la fin du combat? La chute du pavillon, c'est-a-dire la reddition sans condition, a l'adversaire, signifié la fin de la bataille, pour la vaisseau touché qui serait forcer d'en venir là;" this writer continues: "In a naval combat, without doubt, there are principles of humanity to observe, and which are appropriate to avoid unnecessary cruelty, but the issue of the battle cannot be put in jeopardy a single moment, and again no commander can ignore them if they hinder or prevent his evolutions, and cannot insure the invulnerability of ships which carry aid in such moments."

The views of Admiral Paschen are substantially those of Additional Article VI of the Geneva Convention, which provides: "The boats which at their own risk and peril, during and after an engagement pick up the shipwrecked or wounded, or which having picked them up, convey them on board a neutral or hospital-ship, shall enjoy until the accomplishment of their mission, the character of neutrality, as far as the circumstances of the engagement and the position of the ship engaged will permit. The appreciation of these circumstances is intrusted to the humanity of the combatants," etc. Additional Article XII provides: "They [the hospital-ships] must take care not to interfere, in any way with the movements of the combatants; during and after the battle they must do their duty at their own risk and peril."

Such we are assured is all that the humanitarian side of this position could expect, and undoubtedly it is all that will be conceded so long as warfare continues as the final court of appeal for international differences.

It is after a general engagement that the hospital-ship will render its most effective service. This will consist principally in replacing medical officers killed or wounded on the combatant ships (as in the case of the *Reina Christina* at Manila), receiving the wounded to be cared for temporarily or transferred to the base.

The opinions which have prevailed in the recent past as to the rate of mortality in naval engagements have happily, not

been verified by later experience. That shell wounds are of a terrible character in their extent and mutilation we are all aware, from the wounded Russians treated by the Japanese, but it is not likely that shells will ever be as numerous as splinters; furthermore, the range of the modern guns is so great that naval actions are decisively fought at long range, as at Port Arthur and Tsushima, in August 1905, where the killed and wounded was twenty-five per cent, large enough it is true, but small when compared with the encounters of the last century; at Trafalgar, the *Temeraire* inflicted a loss in killed and wounded of 522 out of a complement of 643 on her antagonist, the *Redoubtable*.

The transfer of the wounded from the fleet to the hospital-ship, whether the facilities on board are sufficient to maintain the wounded and enable the hospital-ship to continue with the fleet, or whether she will transport at once to a base, is a question likely to be decided by the number of the wounded, amount of supplies and distance from a base. In an action such as that at Santiago de Cuba, which was decisive, the American hospital-ship *Solace* at once conveyed the Spanish wounded to the United States.

In connection with the debarkation of the wounded to and from a hospital-ship, a service of great importance and difficulty, the method of Surgeon C. F. Stokes, U. S. Navy, is presented for your consideration (devised April 1898). The hospital ship should carry the complete outfit of transferring apparatus, which consists of a wire rope hawser, guiding lines, an adjustable sheave, an electric winch, a weight for taking up slack and a transferring car.

The fighting ship should lie in the trough of the sea, or nearly so. The hospital-ship should approach from the lee until within 150 feet full bows on, when by means of a life saver's rocket, a light line is thrown across the fighting ship to serve as a lead for the wire rope hawser. This hawser is made fast well up on the superstructure.

On the hospital-ship the hawser is led through a large adjustable sheave well forward on the upper deck, and its end is carried around a winch. As soon as the hawser is made fast to

the fighting ship a weight sufficiently heavy to keep the line from sagging into the water, when the car is in use, is let over the side between the winch and the sheave there to be supported in the bight of hawser at this point. It is this weight that keeps the tension constant on the hawser between the ships as they roll or pitch as the case may be.

The splint stretcher serves admirably as a transferring car supported by a wheeled rod.

With the wire rope hawser a light line is carried across to be attached to the transferring car, one end going to the hospital-ship, the other to the fighting ship so that the car can be pulled across and back at will.

It is important that the hospital-ship approach from the leeward as that checks her rolling and gives her a lee beside the fighting ship. In case the ships approach too closely a turn of the propeller will back the hospital-ship away. The end of the hawser being lead over the winch makes it possible to pay out and take up slack. In this way the depth to which the weight over the side will sink can be controlled.

It will be seen that the apparatus is simple of construction, is inexpensive, practically all the parts are carried ordinarily on every ship, and the fighting ship need supply no part of the device. This type of apparatus can be employed in any seaway in which guns can be fought.

An important question in connection with the officers and men who serve on hospital-ships is that the crews should be composed of recruits from the merchant marine, and that no officers of the naval service should serve in these ships, other than those of the medical corps.

Director General Saneyoshi, of the Japanese Navy, says in this connection: "We used officers of the line, in addition to the civilian Captain and crews on hospital-ships, but we removed the combatants for these reasons:

"1st. Because there might be some dispute as to the Hague agreement.

"2nd. Because the naval officers and men might be short and needed, and,

"3rd. We could not use a Cipher-code on the hospital-ships, but use the universal signaling code, so there is no need for the naval men." (Quoted in report of Surgeon W. C. Braisted to the Surgeon General, United States Navy).

Briefly we state the conclusions reached in this consideration as to the function of the hospital-ship in war:

1st. Used at a base as a stationary hospital.

2nd. To relieve a fleet of its sick and wounded, caring for them while remaining in company, or transporting them to a base.

3rd. The hospital-ship as a rule has no place in battle, but should keep such position as will insure its safety, and in no wise compromise its neutrality.

Exceptions to the rule may be found in the case of ships burning, sinking or otherwise disabled, which have lowered their flag and are thus no longer objects of attack, though within the line of fire, and again in case of ships, which of their own initiative, or the movement of the battle, have become isolated, and which are in need of assistance in saving life.*

After a full discussion on the subject the following was adopted.

"The XVII section of the XV International Congress of Medicine, expresses the wish, that all Governments interest themselves in the question of the protection of Hospital-Ships, as complete as possible, in time of war, and during a Naval Action."

THE EYE AS A RECRUITING DISABILITY.

AMONG those who were rejected for the Swedish service in 1901, says F. G. Ask (*Tidskr. i mil. Hälsovård*), 11.1 per cent suffered from diseases of the eye, 29.9 per cent of all the men examined. Out of 1,122 men's eyes examined, 227 were disabled. 4.3 per cent of all eyes were hypermetropic, 5.2 per cent were astigmatic and 6.9 per cent myopic.—HANS DAAE.

*Read before the XVII Section of the XV International Congress of Medicine, Lisbon, April 1906.

GUNSHOT WOUNDS OF THE ABDOMEN—A REVIEW OF FOURTEEN CASES—WITH REMARKS ON THE MORTALITY AND TREATMENT.

By GEORGE TULLY VAUGHAN, M. D.

LATE ASSISTANT SURGEON GENERAL OF THE UNITED STATES
PUBLIC HEALTH AND MARINE HOSPITAL SERVICE.

IN my series of fourteen cases suffering with gunshot wounds of the peritoneal cavity, there were eight cases of wound of the small intestine, six of the large intestine (five of the colon and one of the rectum), five of the diaphragm and pleura, five of the liver, two of the stomach, and two of the kidneys. Several patients had a number of wounds in one organ, while in others several organs were wounded; for example, one patient had eleven bullet holes in the intestine while another had perforation of the liver, stomach and colon.

One of the patients was not operated on, one was operated on late, and twelve were operated on in from one to twenty-eight hours after the reception of the injury.

Nine patients died—a mortality of sixty-four per cent—the cause of death in six cases or in sixty-six and two-thirds per cent being hemorrhage, in one case peritonitis, in one case exhaustion, and in one case shock or the anaesthetic or both.

I know of nothing more which could have been done to save the six patients who perished from loss of blood, except to have operated sooner.

It is difficult to account for the death of case No. 4, though the cause is given as exhaustion, unless we are willing to believe that his strong will power and determination to die turned the scales against him.

Case No. 5, which died of shock, and perhaps the anaesthetic, would almost certainly have died without operation from the effects of eight large bullet holes in the intestines.

Case No. 6 died of peritonitis sixty-nine days after he was wounded. This was a great disappointment, as he should have recovered, and probably would have done so had I drained the peritoneal cavity or removed the bullet before permitting him to leave the hospital.

Gunshot wounds of the abdomen have always given a high mortality, whether in peace or in war, but since the introduction of the modern military rifle discharging a very small missile with great velocity, the mortality of such wounds has been reported as less than that from similar wounds inflicted by the larger and more slowly moving balls of older arms, and of those used outside of the military service. Treves states that only forty per cent of gunshot wounds of the abdomen in the Anglo-Boer War, not operated on, died, but it has been well said (Hildebrandt) that if those were included who died of such injuries on the battlefield and during transportation, the mortality would exceed seventy per cent. Haga is quoted as giving the mortality of gunshot wounds of the abdomen in his division during the Chino-Japanese War as 77.1 per cent. In view of the rule, which has few exceptions, that every case of gunshot wound of the abdominal cavity is attended with injury to the viscera, the best method of treatment is generally agreed to be early laparotomy, arrest of hemorrhage, closure of visceral wounds, and toilet of the peritoneum. The only question as to the propriety of this method arises when circumstances are unfavorable for aseptic work, as on the field of battle or elsewhere away from the conveniences of a modern hospital. Under such conditions it is maintained by some that expectant treatment gives the best results. To decide this question would require the study of many more cases than I present, or than have ever yet been reported, and a careful comparison of the results following respectively operative and expectant treatment. That recovery without treatment can follow perforation of the intestine by gunshot wounds cannot be questioned. The mucous membrane of the stomach and intestine being of much greater area than the other coats and lying in folds loosely attached to the other coats, often prolapses through an opening in the stomach or intestinal wall, and may plug it so securely that healing fol-

lows with little or no infection. Experiments on animals show that such closure occurs only when the opening is less than one-fifth of an inch (5 cm.) in diameter (Klemm).

In case No. 7 there was undoubtedly perforation of the liver and injury to the colon resulting in a fecal fistula, yet the patient recovered without operation. In case No. 14 there must have been perforation of the liver and of several coils of intestine by a small bullet, yet this patient recovered after one abscess had opened into the bowel and another had been opened externally. But the results in these two cases do not argue against laparotomy, since their recovery was more a matter of good luck than the result of any exercise of good judgement, and the chances of recovery in the second case would have been much increased, and his time of convalescence materially shortened by a primary laparotomy. Personally, I am decidedly in favor of early operation, even at the risk of not performing an aseptic operation, because I believe the danger from hemorrhage is far greater than that from any infectious material which may enter on account of the operation; besides, such an unaseptic operation may be the means of preventing infection by affording an opportunity to cleanse the peritoneal cavity and to close openings in the intestine. The sooner after injury the operation can be performed, the better. It is bad judgment to wait for the symptoms of shock to pass away before operating, because in this time the patient may be bleeding to death internally, and the symptoms of shock may be due to hemorrhage. One hour is too long to wait if the operation can be done sooner. Valuable time should not be lost in estimating the amount of haemoglobin or in getting the patient's blood pressure, although there is no objection to making use of these aids to diagnosis, provided the patient's condition will permit it. On opening the abdomen—preferably through the wound of entrance or exit of the ball where such an incision will permit a good command of the field—the surgeon's attention should first be given to ascertaining whether or not bleeding is going on. If it is, it must be controlled before doing anything else. Suture of perforations of the intestine must be delayed until the bleeding has been stopped. With the abdominal cavity almost filled with blood

which returns faster than it can be sponged away, it is often a very difficult matter to find the source of bleeding. The suggestion to control hemorrhage in these cases by compressing the abdominal aorta has not given satisfaction in my experience.

I know of no better plan than, first, to bear in mind the course of the ball as determined before operation, and the organs which would be most likely to lie in its pathway; second, make plenty of room for manipulation and inspection by means of long incisions, supplemented, if necessary, by cross incisions; if the source of bleeding does not appear, pack in gauze towels in order to control the hemorrhage as much as possible while a systematic search is made for its source. Examine first the mesenteric vessels—as the most dangerous hemorrhage usually comes from them—tracing them rapidly in their course through the fan-shaped mesentery to form the vasa intestini tenuis and supply the intestine. Next examine the great vascular trunks—the aorta and vena cava—then any other organs as liver, spleen, kidneys, pancreas, bladder and rectum, which lay in the pathway of the ball.

Having stopped all bleeding, wounds of hollow viscera must then be sought and closed, when found, with fine silk sutures. The bladder, rectum and ureters should not be overlooked. Time can often be saved if the entire course of the ball is known by limiting the area of examination to this line. For example, if the ball entered at the navel and made its exit just below the twelfth rib on the left side, there would be no need of wasting time in examining the liver or right kidney or right ureter. According to my experience the wounded intestine is usually found not to have moved from the position it occupied when wounded. I suppose, if the patient should be inverted or violently shaken, this might not hold good. An exception should be made in case of the stomach; if distended at the time of perforation, the contents might escape and the stomach would contract and possibly withdraw to some distance from the pathway of the bullet. Finally the abdominal cavity should be carefully cleansed by irrigation with large quantities of warm salt solution, then closed, with or without drainage—the latter if there has been no extravasation

of intestinal contents nor the ligation of any large mesenteric vessel. When in doubt, it is best to provide drainage.

CASES.

WOUND OF THE LIVER, COLON AND KIDNEY.

Case 1.—S. D., male colored, aged 18 years, shot March 5, 1898, pistol ball .32, entering between 8th and 9th ribs in front of right anterior axillary line. Next morning blood was noticed in the urine and patient had vomited twice. X-ray located ball in back one and a half inches to right of navel and three inches from the front. Laparotomy, March 6, about twenty-eight hours after injury, incision along outer border of right rectus afterwards supplemented by a cross incision just below ribs on the right side. The ball was found to have passed through the right lobe of the liver, edge of the hepatic flexure of colon and lower part of right kidney into the muscles of the back, where it was lost.

The wound in colon was closed with silk sutures also the one in the anterior surface of the kidney—the wound in the liver was not bleeding and was left alone. Flushing with hot salt solution. No drainage.

Recovery rapid, but large x-ray burn developed on abdomen which required a year to get well.

Case 2.—G. A. F., white male, 31, native of Virginia, shot 9:15 night of May 26, 1898. Forty-five minutes later pulse eighty-four, no vomiting or nausea, some pain in bowels. Bullet had entered left side of abdomen, about midway between navel and anterior superior spine of ilium—one inch above this line and a little nearer the navel.

Operation at once under chloroform: Incision through left rectus about five inches including wound—ten holes in small intestines (eight in lower jejunum and two in ileum) and ten openings in the mesentery were found (five perforations of both layers)—twenty holes were sewed up using fine silk and two rows of sutures in most cases. The pistol ball, a .41, was found wrapped in the omentum. About half a pint or more of blood in the abdominal cavity but no intestinal contents visible. Salt solution flushing. No drainage. Stitches removed the 15th day. Recovery without incident.

WOUNDS OF STOMACH (2), AND INTESTINES (5), DEATH FROM HEMORRHAGE.

Case 3.—J. L., colored male, aged about 35, was shot about 3 p. m., December 12, 1899, the ball, .41, entering the back about two and one-half inches to the left of the median line and just below the last rib. It passed through and could be felt under the skin in front about two inches from the median line and one inch below the navel on the left side. Patient in bad condition, pulse 120, extremities cold, vomiting, thirst and restlessness—from hemorrhage. Operation about three hours after injury; ether, incision through left rectus, later joined by a transverse incision to the left near the ribs—the ball was removed being in the incision. Blood gushed out—prob-

ably three pints of clots and blood—seven openings were sewed up—two in the stomach near the pylorus and greater curvature and five in the small intestine, besides two wounds scarring but not opening the intestine were sutured. Flushing with hot salt solution. No drainage. Patient died about one hour after operation.

The three foregoing operations have been published in full, and only a synopsis is given here to complete the record.

WOUND OF LIVER—DEATH FROM EXHAUSTION.

Case 4.—S. M., white male, aged 60, Ohio, clerk, killed the second auditor for the War Department, December 22, 1900, and then cut his own throat and shot himself. An hour later when seen at the Emergency Hospital, he was in good condition, perfectly calm, but insisted that he did not want to recover and wanted nothing done for him. He finally agreed to submit to operation. Ether was given and a bullet hole was seen about half way between the median and left nipple line and about three inches below the level of the nipple. A probe easily passed through the wound between two costal cartilages into the abdominal cavity. Pulse was 90 to 100 and irregular. Incision in median line from ensiform cartilage to navel. Blood clots escaped and blood welled up from deep within. The ball had passed obliquely through the left lobe of the liver producing something like an explosive effect, tearing out a piece from the anterior border about one inch in diameter and producing radiating fissures one of which extended about three inches toward the right lobe and involved the entire thickness of the left lobe. The ball then plowed a furrow in the under surface of the right lobe, thence obliquely downward to lodge under the skin just above the crest of the right ilium—without wounding intestines, gall bladder or bile ducts—so far as could be ascertained. The long deep fissure in the left lobe was closed with cat gut sutures and gauze was packed in the furrow of the right lobe to stop hemorrhage. Wound closed except upper angle through which projected end of gauze packed in liver.

Patient had slight vomiting daily after operation, but pulse and temperature were good—except for irregularity of pulse.

The gauze was removed on the fourth day—it was stained with blood and bile.

Death occurred December 29, seven days after operation—apparently from exhaustion. The patient consistently maintained his determination to die although he appeared to be gentle and tractable as to obeying orders, and this might have turned the scale against him.

Necropsy showed nothing remarkable except a little bile in the abdominal cavity from wound of right lobe—the left had closed as if healed. Only local reparative peritonitis was present.

EIGHT WOUNDS OF INTESTINES—DEATH FROM SHOCK.

Case 5.—F. M., female negro aged 9 years, shot accidentally with a pistol

the night of June 30, 1901. The ball entered the right iliac region almost exactly at McBurney's point but a little nearer the navel. A little less than an hour after being shot patient had vomited twice, pulse was 150 and she complained of being cold. Under chloroform the abdomen was opened through the right rectus including bullet wound in incision—blood in peritoneal cavity. Eight holes were sewed up in the ileum—the lowest about two feet from the caecum. Pulse became very thready and rapid and finally could not be counted, strychnine was given and salt solution under skin but patient suddenly ceased breathing, heart's action apparently stopped at the same time. Lowering head and artificial breathing for twenty minutes of no avail.

Death probably from shock though operation was not long—about half hour and not much blood was lost.

FOUR WOUNDS OF INTESTINES—DEATH AFTER SIXTY-NINE DAYS.

Case 6.—H. S., male negro, twenty-five years old, was shot with a .32 pistol ball about 3 p.m., September 14, 1901. The ball entered six inches below the left nipple and one inch to the left of the median line and bled very little externally. Four and a half hours later pulse was eighty, no sign of shock, no vomiting, but there were severe pain in the epigastrium and hicough occasionally. Under chloroform—then ether—abdomen was opened through left rectus including the bullet hole. Considerable blood in abdominal cavity. Four holes in the jejunum, the nearest twelve inches from the stomach, were closed—also three openings in the mesentery. The ball evidently passed into the muscles of the back. Hot salt solution used to flush out abdominal cavity and wound was closed without drainage. There was suppuration in lower angle of the wound between skin and muscle. This finally healed. November 1st, one month and a half after injury, patient was up and able to walk by holding to objects. Skiagram taken showed ball located in angle between the spine and crest of ilium on left side and would have been removed when patient got stronger. On this day, November 1st, against advice he insisted on going home.

Soon after an abscess was opened in the back and the ball and a piece of cloth extracted. Death occurred November 22, sixty-nine days after the operation.

Necropsy revealed general peritonitis, intestinal adhesions and pus in the pelvic cavity. The wounds in the intestine had healed but could be seen. The abdominal cavity communicated with the abscess in the back and it was thought that this abscess had broken into the abdominal cavity.

WOUND OF LIVER AND COLON—NO OPERATION—RECOVERY.

Case 7.—P. J., negro, male, twenty-eight, Va., was shot with a .38 or .41 pistol ball January 8, 1903. Little bleeding followed but patient vomited two or three times. He was admitted to hospital two days later. The ball entered the right side over the lower border of the fifth rib, one inch to the

inner side of, and one inch below the right nipple, passing between the fifth and sixth ribs through the abdomen and lodging under the skin on the left side between the ninth and tenth ribs in the posterior axillary line, eight inches from the left nipple and eight and one-half inches from the anterior superior spinous process of the ilium—where it was removed.

Patient's condition was good, a slight cough developed and a few rales could be heard at the base of the right lung, no expectoration of blood—he complained of the restricted diet. Pulse ranged from eighty-four to 119, temperature from 100° to 103° —once 104° . Next morning, January 23, fifteen days after receipt of the wound, a fecal discharge was found on the dressing over the wound of exit. The fecal discharge continued until February 4, ceased spontaneously, and patient was discharged recovered February 10. The ball must have passed through the right lobe of the liver and the descending colon and possibly opened the latter behind the peritoneum so that the peritoneal cavity escaped infection.

WOUND OF LIVER, STOMACH, AND COLON—DEATH FROM HEMORRHAGE.

Case 8.—M., negro male, aged thirty-five (about), was shot about 1 a.m., May 27, 1903. Eight hours later he was suffering from nausea, vomiting, abdomen swollen and tympanitic, pulse 120, facial expression bad.

Under ether a bullet hole was seen one inch to the right and slightly above the ensiform cartilage—abdomen opened through right rectus. The ball had passed through the left lobe of the liver, the stomach from lesser to greater curvature near the pylorus, thence cutting a notch in the sigmoid flexure opening it, after which the course of the ball was lost. The wounds three in number, were closed with silk. There was much blood in the abdominal cavity—salt solution was used freely in the abdomen—but the patient died on the table—evidently of hemorrhage.

WOUND OF THE INTESTINE—TWO PERFORATIONS—RECOVERY.

Case 9.—S. C., white male, sixteen years old, school boy, accidentally shot March 23, 1904, about 12.30 p.m., by a .22 calibre rifle. When seen at 3 p.m., pulse 120, temperature—axillary— 97° , he had vomited three times and had a good deal of pain in the abdomen. The ball had entered on the right side midway between the anterior superior spine of ilium and median line and about two and one-half inches to right and below navel. Under ether, the wound was carefully followed down by dissection (as probe would not go in) until the peritoneal cavity was found perforated—so it was opened freely. Considerable blood and clots (probably four ounces), found in pelvis. Two holes found in the ilium about three fourths of an inch apart and about twelve inches from the caecum. Closed with Mathews sutures—one row of silk. No extravasation of intestinal contents visible. Ball was not found. Flushed with hot salt solution—abdomen closed without drainage. Recovery without incident.

WOUND OF ABDOMEN—BLANK CARTRIDGE—DEATH FROM HEMORRHAGE—
BLOOD VOMITED.

Case 10.—J. J. S., white male, aged fifty-eight, policeman, was shot about 9 p. m., July 4, 1904. When seen by me about one hour later at Georgetown University Hospital there had been no vomiting, but patient was weak and faint from loss of blood. The wound had been dressed with gauze to stop hemorrhage. Ether was given but as patient took it badly—pulse 130 to 140—respiration rapid—chloroform was given and the wound was examined. It was a large irregular wound, easily admitting the thumb down to the peritoneum, situated one and one-fourth inches to the left of the navel and on the same level. It was enlarged by incision above and below and a small opening was then found in the peritoneum—the bleeding was from the rectus muscle. Still thinking I had a bullet wound to deal with, though surprised at the size and irregular shape of it, the peritoneum was opened and the viscera carefully examined. No blood in peritoneal cavity, no perforation of viscera—the only thing found was a contusion of the mesentery of a portion of the small intestine just beneath the wound. No ball or other missile could be found. Abdomen closed, with gauze drain. That night patient vomited a large quantity of dark coffee ground material. Next day he did the same thing and was a little delirious. This vomiting of dark blood continued daily. During the night of the 6th he vomited a larger quantity than usual, his temperature fell to subnormal, pulse rose to 166 and death occurred at 7.15 a.m., July 7, two and a half days after injury.

Necropsy by the coroner showed no bullet or wad—no wound or injury of viscera except contusion and ecchymosis of a coil of small intestines. No sign of bleeding in the stomach.

Remarks: It is difficult to account for the source of bleeding which was evidently the cause of the patient's death, except on the theory that it came from the small intestines which had been contused. What caused the wound is also a mystery—whether it was the small pasteboard disk used to keep the powder in the shell or whether it was due to the explosive force of the powder is not known.

WOUND OF INTESTINE—FIVE HOLES AND LACERATION—RESECTION—
DEATH FROM HEMORRHAGE.

Case 11.—E. C., white male, 15 years old, shot himself accidentally with a .32 calibre pistol about 4 p.m., July 9, 1904. When seen two hours later, his pulse was a little over 100 but exceedingly weak, face pale, pupils dilated, had vomited several times and had severe pain in abdomen. There were pain and numbness in the right leg and foot. The ball had entered one inch to the left of the median line on a line drawn from the center of the symphysis pubis to the anterior iliac spine—the wound was large, powder burnt and blood flowed freely from it. Incision through left rectus—blood gushed from the abdominal cavity and it was some time before the source of

hemorrhage could be found. It was a large branch of the superior mesenteric. The ball had made five openings in the bowel, cut the small intestine through half its circumference, and then cut the large artery mentioned. The mesenteric branch was ligated and eight inches of intestine opposite, which had been lacerated and contained two openings, were excised and the ends joined by suture. The three other holes were closed with one row of silk sutures for each opening. Resection was decided on chiefly because of the danger of gangrene from cutting off the blood supply which came from the large mesenteric vessel which required ligation.

The wounds were about the middle of the small intestine. Abdomen was irrigated with hot salt solution and closed without drainage. Patient vomited blood frequently during operation. Salt solution was used freely by hypodermoclysis and rectum but death occurred next day at 2 p.m., about twenty hours after the operation, from exhaustion due to loss of blood.

The ball was not seen—it had passed into the muscles of the back and probably wounded a cord of the sacral plexus.

WOUND OF LEFT PLEURA, DIAPHRAGM, KIDNEY AND COLON—DEATH
FROM HEMORRHAGE.

Case 12.—H. C. C., colored male, aged thirty-nine years, minister, was shot with a .32 calibre pistol about 11 p.m., September 8, 1904. When seen about fifteen and a half hours later he had a pulse of ninety, temperature of 98.6° anxious countenance, and tympanitic abdomen. The ball had entered in the left anterior axillary line over eighth rib, passed between the eighth and ninth ribs, through the pleura and diaphragm, the splenic flexure of the colon and left kidney downward and backward. Just before the operation bloody urine was passed. Under ether the abdomen was opened through the left rectus muscle and a transverse incision to the left. Blood was found in the peritoneal cavity and behind the peritoneum extending from the left kidney downward to the sigmoid flexure of the colon.

One hole in the splenic flexure of the colon was sutured—no other could be found—one of the vasa brevia was bleeding freely and was ligated and the wound in the kidney was closed with catgut continuous sutures. The abdomen was flushed out with hot salt solution and closed, leaving room for a gauze drain in the lower angle.

Operation was difficult as patient was very fat.

Death occurred twenty-four hours later as a result of loss of blood.

WOUNDS OF INTESTINE BY A SHOT THROUGH THE PELVIS—ELEVEN
HOLES—DEATH FROM HEMORRHAGE.

Case 13.—G. A. M., white male, aged twenty-four, school teacher, was shot about 3 p.m., April 6, 1905. When seen at 8 p.m., his pulse was 150, but was imperceptible at the wrist; temperature in mouth, 95.8; he was perfectly conscious, calm and collected, but was thirsty and somewhat restless, pupils contracted (from morphine); he had some pain in bowels and had vomited once.

Salt solution, about 1,000 c. c., was injected into the median basilic vein, and ether was given. The ball had entered one and a half to two inches below and behind the right anterior superior spinous process of the ilium, and a probe passed through the bone into the pelvis. Incision along the outer border of right rectus muscle; a large quantity of dark fluid blood, probably 2,000 c. c. (two quarts) was found in the abdominal cavity. This was washed out, and the course of the ball traced. It entered the pelvis on the right side just below the external iliac vessels, passed through the rectum, through the sigmoid flexure, through several coils of small intestine, and disappeared in the left wall of the pelvis, almost exactly opposite its point of entrance. In its course it made eleven holes in the intestines, two in the rectum, two in the sigmoid flexure and seven in the ileum; all were closed with silk sutures. No extravasation of intestinal contents was seen, but a faecal odor was perceptible. Abdomen was flushed out with several gallons of hot salt solution and closed without drainage. The patient's condition seemed better at the close of the operation than at the beginning. Next morning temperature was to 99.6°, but pulse was 150 and during the day he was slightly delirious at times, and death occurred at 11 p.m., about twenty-six hours after the operation—from hemorrhage.

WOUND OF LIVER AND INTESTINES—LATE OPERATION FOR ABSCESS,
RECOVERY.

Case 14.—W. T., white male, aged forty years, was shot March 20, 1905, by a .22 calibre rifle. The ball entered the right side in the anterior axillary line about four inches below the right nipple between the sixth and seventh ribs, and must have perforated the right lobe of the liver as well as the intestines. When seen about one hour after the wounding he was suffering from shock, with weak pulse and cold extremities. He refused to submit to operation. Five hours later he vomited dark blood, and continued to do so at intervals of a few hours during the next four days. On the third night blood was passed by the bowels. The abdomen became distended and tympanitic, the pulse 110 to 120, temperature 101° to 103°, and there was delirium. These symptoms continued for several days, then diarrhoea set in and continued for about ten days with six or seven passages daily. April 8, nineteen days after the injury, the swelling of the abdomen had subsided sufficiently to outline a mass in the right lower quadrant of the abdomen. April 11th patient had twelve large stools, reddish in color, slimy and bloody, the mass in the abdomen almost disappeared, and the patient's general condition improved. Evidently the abscess had broken into the bowel. Three or four days later the temperature and pulse again rose and the mass in the abdomen became larger, so that on May 1, forty-one days after the wound was received, it was decided to open it. This was done by an incision through the right rectus over the swelling. The abscess lay between the anterior abdominal wall and the intestines, which were strongly united by adhesions so as to shut in the abscess on all sides except below

where an opening large enough to admit the finger communicated with the pelvis, from which considerable pus was removed by irrigation. The abdomen was closed leaving a rubber tube extending into the pelvis. Pus was discharged through the tube for about a month, when the abscess cavity was allowed to close. In June patient developed a cough with mucopurulent expectoration, but in August, five months after the wound was received, he was in good health, evidently fully recovered from the wound.

DISCUSSION.

Dr. H. D. CORBUSIER, U.S.A.—Is there any particular form of drainage that you use?

ASSISTANT SURGEON GENERAL VAUGHAN.—I have drained only two of my cases and I prefer the rubber tubing, and when the patient lies on his back I drain from the back.

GENERAL JEFFERSON D. GRIFFITH, N.G.Mo.—I have operated on a number of cases and I have pursued one course. Whenever there was any intestinal wound and there was extravasation, I have used the suprapubic cigarette drain. I wrap the gauze with rubber tissue and pass it down to the bottom of the pelvis, and I prop up the patient so I can catch everything in the most dependent part.

BACTERICIDAL ACTION OF BROMINE AND HYDROCHLORIC ACID.

SUCCESSFUL experiments on bromine and hydrochloric acid, as to their positive bactericidal action on typhoid and cholera germs in water, are reported (*Voyenno-med. Journal*) by K. G. Serpoffsky, of the Imperial University, Urieff, Russia. He confirms fully all former experiments made by Shepileffsky and Novitsky made recently in the laboratory of the Medico-Military Science Committee and demonstrated the total destruction in five minutes of typhoid bacteria by the addition of 0.06 gms. of pure bromine to one liter of infected water. He reports a similar action of bromine on cholera vibriæ, with the exception, that it took fifteen minutes and 0.07 gms. of bromine to one liter of infected water to accomplish a complete destruction of the vibriæ.

He also asserts that the addition of 0.175 of HCl to 250 c.c. of water containing typhoid bacteria (about 0.07 HCl to 100 c.c. water) will completely destroy the bacteria in thirty minutes, a slight addition of bicarbonate of soda neutralizing the water.—W. F. DE NIEDMAN.

THE ROLL OF HONOR FOR 1904-1905.

By CAPTAIN SAMUEL CECIL STANTON.

ASSISTANT SURGEON IN THE ILLINOIS NATIONAL GUARD;
CHAIRMAN OF THE NECROLOGY COMMITTEE.

DURING the year past the Association has lost by death one corresponding member, fourteen active members, and one honorary member, a total of sixteen, and in addition the committee reports the death of one member, notice of whose

demise was not received until after the meeting in St. Louis last year. Of the deceased members, one was a surgeon general in the German Army; four were officers of the medical department of the United States Army; three members of the medical department of the United States Navy; two surgeons of United States Volunteers, and seven members of the medical departments of the National Guards of the several states.*



General Charles Smart.

cerebral hemorrhage, aged 64. He was born in Aberdeen, Scotland, September 18, 1841, son of Alexander and Annie Kelman Smart. His preliminary education was received at Keith, Banffshire and Marischal Colleges. He was graduated from the Univer-

Brigadier General Charles Smart, U. S. A. (retired), an active member of the Association, died in St. Augustine, Florida, April 23, 1905, after a long illness, from

*This report has been unavoidably delayed by the author's illness,

sity of Aberdeen in 1862, with the degrees of M.B. and C.M. Immediately upon his graduation he came to New York and on November 5, entered the military service as First Lieutenant and Assistant Surgeon of the 63rd New York Infantry and served with that command until April 16, 1864, when he was mustered out of the service. He was commissioned First Lieutenant and Assistant Surgeon in the Army, March 30, 1864, and was made Brevet Captain "for meritorious services in the field during the present campaign before Richmond, Va.," on December 2, 1864. He was medical inspector of the 2nd Corps, Army of the Potomac until June, 1865, was in charge of the army hospitals, at Camps McDowell and Tucson, Arizona, from 1865 to 1870; at Sedgwick Barracks, Washington, D.C., until 1870; at Fortress Monroe, Virginia, until July, 1873; at Fort Bridger, Wyoming, until July, 1876; at Camp Douglas, Utah, until November, 1877; at Camp Brown, Wyoming, saw active service from September to October, 1877; in New York from January to March, 1878; and at Fort Preble, Maine, until September, 1879.

He was commissioned Captain and Assistant Surgeon, July 28, 1886; Major and Surgeon, June 30, 1882; Lieutenant Colonel and Deputy Surgeon General, March 3, 1897; Colonel and Assistant Surgeon General, February 2, 1901, and was retired with the rank of Brigadier General, January 19, 1905.

In 1879 Captain Smart was ordered to Washington for duty with the National Board of Health and continued to be a member of this Board until its abolition. He was in charge of the department of Statistics and Sanitation of the Surgeon General's office from 1879 to 1903 and chief surgeon of the Division of the Philippines, 1903-4; was special inspector of Camp Alger, Va., in 1898 and a member of the Board to select a site for Camp Meade, Pa., in 1898; special inspector of Camp Wikoff, Montauk Point, L.I., 1898 and president of several hospital corps boards at various times. During his service with the National Board of Health he was sent to Memphis, Tenn., and other fever stricken cities of the South to investigate the water supplies and conducted many other important investigations for the Board. During his service in the office of the Surgeon General of the Army he com-

piled and edited the third medical volume of the Medical and Surgical History of the War of the Rebellion and subsequently was disbursing officer of the medical department in Washington and in charge of the sanitary division of the office. He was a member of the faculty of the Army Medical School; was professor of Hygiene from 1892 to 1903 and was President of the school subsequent to July 2, 1902. He served as a member of various boards including examining boards for admission of candidates to the Medical Corps, boards for the preparation of hospital corps drill and for Manual for the Medical Department and board on emergency rations. He compiled and published "A Handbook for the Hospital Corps," which was in use for many years as the text-book on the subject.

He represented the Medical Department of the Army at the meetings of the American Public Health Association, in 1892, 1894, 1896 and 1897 and was for many years chairman of its committee on pollution of water supplies. In connection with the Act of March, 1887, organizing the hospital corps, he arranged the system of examination for the appointment of hospital stewards and acting hospital stewards. In 1889 he organized the identification system for deserters by means of outline figure cards.

In addition to the books already mentioned and many valuable papers in the American Health Reports, General Smart was a frequent contributor to medical literature and especially to encyclopedic medical works. In the Reference Handbook of Medical Sciences he wrote the articles on Air, Malaria, Miasm, Water, Quarantines, an Army Field Hospital Organization; contributed the article on Hygiene in Ziemssen's Cyclopaedia; on the Medical Department of the Army in the third volume of the Transactions of this Association; and for many years was Washington correspondent of and an editorial contributor to the *Journal of the American Medical Association*. While serving as Chief Surgeon of the Division of the Philippines, he had a cerebral hemorrhage which necessitated his return to this country and eventually his retirement. He was a member of the American Medical Association, and repeatedly a delegate to that body from

the Army Medical Department; member of the American Public Health Association and repeatedly delegate to represent the Army. General Smart is still represented in the Medical Department of the Army by his two sons, Lieutenants Robert and William A. Smart.

General Smart combined with brilliant scientific attainment a great capacity for hard work together with an unfailing loyalty to duty. His death is a great loss to the medical department of the Army and to the medical profession in general.

Major Abner D. Kimball, U.S.V., an honorary member of the Association since 1893, died at his residence at Marion, Ind., within the grounds of the National Home for Disabled Volunteer Soldiers, November 11, 1904, from diabetes, aged 65.

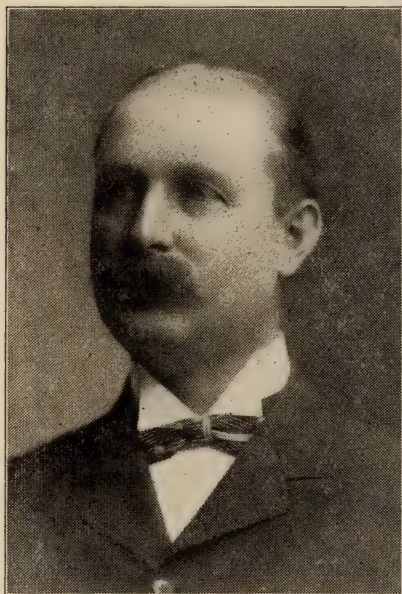
He was born in Coshocton County, Ohio, January 24, 1839, the son of Moses Kimball and Louisa Powell. He received his preliminary education in the public schools of Indiana and took his medical course at Rush Medical College, Chicago, being graduated from that institution in 1860. He took a supplementary course at Bellevue Hospital Medical College, New York, and received a degree from that institution in 1868. He began practice in 1860 at Converse, Ind., but at the outbreak of the Civil War he at once entered the service and was made Lieutenant and Assistant Surgeon in the 48th Indiana Volunteer Infantry and in 1864 was made Captain and Assistant Surgeon in the 99th Indiana Volunteer Infantry. He was with General Sherman and accompanied the army in the famous March to the



Major Abner D. Kimball.

Sea. At the close of the war he returned to Converse and in October, 1865, was married to Miss Henrietta Haupt, of Wabash County, Indiana, who survives him. Four children were born to Dr. and Mrs Kimball, three of whom, Miss Nellie Kimball, of Marion, Ind., Dr. E. H. Kimball, Dentist, of Marion, Ind., and Dr. Clyde Kimball, of Mt. Carmel, Ill., survive.

In 1884 Dr. Kimball moved to Marion which he afterward made his home. Dr. Kimball was one of the organizers and at one time President of the Grant County Medical Society. In 1890 he was appointed chief surgeon of the National Home for Disabled Volunteer Soldiers at Marion, Ind., and retained that position until his death. This position gave him the rank of Major. He had been ill with diabetes for a considerable time and the disease was excited again by a septic wound of the foot.



Major John Patrick Lombard, M.V.M., an active member of the Association, died from heart disease at his home in Dorchester, Boston, Mass., March 21, 1905, aged 44.

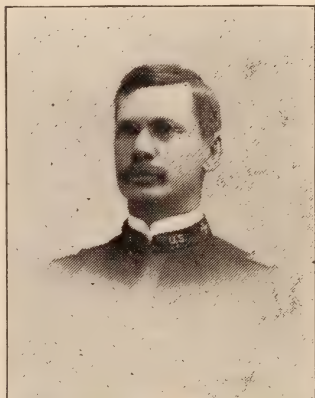
He was born February 14, 1861, in Medford, Kings County, Nova Scotia, son of James and Mary Lombard. His elementary education was received at Medford. He afterward attended Kentfield Academy and the Provincial Normal School at Truro, N.S. and later was a student at St. Francis Xavier College. In 1884 he removed to New York and entered the New York University Medical Department and was graduated from that institution in 1887. He began practice in Dorchester

the following year and for the past fifteen years has lived at Fields Corner, Mass. July 20, 1899, he was commissioned Major and Surgeon of the 9th Regiment, M.V.M., and served in that capacity until the time of his death.

He was a member of the Massachusetts Medical Society and of the Boston Medical Library Association. His wife and two children survive him.

Major William Cummings Shannon, U.S.A., an active member of the Association, died at his home, Elkhorn Farm, Nebraska, April 21, 1905, from nephritis after an illness of eight years, aged 53.

He was born in London, N.H., May 8, 1851, son of Dr. Nathaniel and Lucy M. Cummings Shannon. He took a medical collegiate course at Bellevue Hospital Medical College, New York City, from which he was graduated in 1874. He entered the Army as First Lieutenant and Assistant Surgeon June 26, 1875. He served at various army stations until he went on sick leave from July 18, 1897, and was retired April 23, 1898.



Maj. Wm. Cummings Shannon.

He was made Captain and Assistant Surgeon, June 2, 1880. In 1891 he was medical officer of a surveying party under the Inter-continental Railway Commission and served in this capacity in Central America for two years. He was also ordered by the War Department to collect "useful information" and made a collection of insects and plants along the line surveyed. These were distributed to the U.S. National Herbarium, Washington, Harvard University Herbarium, the Royal Botanic Gardens, and other public Herbariums. A complete set of the plants—400 in number—was reserved for the Johns Hopkins University, Baltimore. He made a small collection of photographs illustrating the use of the travois in transporting the wounded and these are

deposited in the Library of the Association of Military Surgeons of the United States. On April 18, 1875, he was commissioned Major and Surgeon and in the same year he took a course in bacteriology at the Johns Hopkins University, Baltimore. In the same year he was married to Miss Elizabeth E. Poppleton of Omaha, and spent a portion of his leave abroad in France and England.

On April 23, 1898, he was retired from the Army on account of ill health contracted in the line of duty. After this time he spent his winters in Arizona and at his winter home in Hot Springs, Ark.



Surgeon Samuel Henderson Griffith.

Surgeon Samuel Henderson Griffith, U.S.A., an active member of this Association, died at his home in Washington, April 23, 1905, from cholecystitis, after an illness of six weeks, aged 53.

Dr. Griffith was born at Holguin, Cuba, November 11, 1851. He received his early education in the private and public schools of Philadelphia and the Central High School of that city. He was graduated from the Department of Medicine of the University of Pennsylvania, Philadelphia, in 1873, and was interne in the Philadelphia Hospital for a year thereafter. After this he was attending physician to the Northern Dispensary and to St. Mary's Hospital, Philadelphia. He was commissioned assistant surgeon in the Navy, December 15, 1877, was promoted passed assistant surgeon, October 11, 1881, and to surgeon, March 30, 1895. He was detailed to the U.S. Naval Academy in 1878.

His later duties were on the U.S. Steamship *Alaska*, making the voyage around Cape Horn and serving in the Pacific; special duty in Washington, D.C.; U.S. Flagship *Lancaster*; Museum of Hygiene, Washington; U.S. Steamships *Dolphin*, *Jamestown* and *Constellation*; Museum of Hygiene, Washington; U.S. Steamships *Mayflower* and *Prairie* during the Spanish-American War; in charge of the medico-naval exhibit at the Pan-American Exhibition at Buffalo, from May 15 to October 8, 1901 and Fleet surgeon of the Atlantic Training Squadron and U.S. Flagship *Minneapolis* until the time of his last illness. He was a delegate to the Pan-American Exposition, Buffalo, in 1901, and to the American Public Health Association in the same year.

Surgeon Griffith had to his credit over twelve years of sea service and a nearly equal amount of shore duty. While serving in the Atlantic Training Squadron off Guantanamo he was taken ill with cholecystitis and was ordered home. After a strong battle against inevitable illness he died at his home in Washington.

Generalarzt Karl Eduard von Fichte, Surgeon General of the Württemberg Army, corresponding member of the Association, died at his home in Stuttgart, Germany, May 8, 1905, aged 78.

He was born at Saarbrück Rhenish Prussia, March 24, 1826, son of T. Herman and Wilhelmine Faber von Fichte. He received his preliminary education in the schools of Düsseldorf and Bonn; from 1837 to 1842 he studied in the Gymnasium of Bonn; from 1842 to 1843



Generalarzt Karl Eduard von Fichte.

in Tübingen, Württemberg. He received his medical education at the Universities of Tübingen, Vienna, Prague and Paris. He received his degree of Doctor in Medicine in 1849 and his degree of Doctor of Public Medicine in 1901. From 1852 to 1855 he was a privat-docent in surgery and ophthalmology at Tübingen and from the Spring of 1852 to July, 1855 was assistant in the surgical clinic at Tübingen. He served as Second Lieutenant in the Medical Department from 1855 to 1859; as First Lieutenant from 1859 to 1865; as Captain from 1865 to 1868; as Major from 1868 to 1871; as Lieutenant Colonel from 1871 to 1881; as Colonel from 1881 to 1891; as Major General from 1891 to 1896; as Lieutenant General from 1896 to 1903 when he was commissioned as Surgeon General. He served as chief surgeon in the field

in 1866 and was chief sanitary officer in Württemberg troops in the field during the Franco-German War, 1870-1. He also served as juror in the Exhibition of Hygiene at Berlin in 1883. From 1877 to 1896 he was chief of the Royal Württemberg Ministry of War.

He made many contributions to periodical surgical literature. He was a member of the Württemberg Ärztliche Verein, and of the Gesellschaft für Natur und Heilkunde, Dresden.

Surgeon Hatton Nathan Thompson Harris, U.S.A., an active member of

Surgeon Hatton Nathan Thompson Harris. the Association, died at the Naval Hospital, Pensacola, Florida, May 19, 1905, from appendicitis, aged 43.

He was born at Harrisonburgh, Va., April 1, 1862, son of John T. and Virginia M. Miller Harris. His preliminary education



was obtained in the graded schools of Harrisonburgh, Va., and from private instructors. He attended the University of Virginia in Academic Department, 1880-1 and was for a time teacher in the Harrisonburgh, Va., graded school. His medical studies were undertaken at the Medical Department of the University of Virginia, in 1882-3 and the College of Physicians and Surgeons in the City of New York where he completed his course being graduated in May, 1885. His preceptor during his attendance at Columbia University was Dr. L. Emmett Holt. For the next two years he took hospital and special courses and entered the U.S. Navy being commissioned Assistant Surgeon, June 13, 1887. He was made Passed Assistant Surgeon, June 30, 1891 and attained the rank of Surgeon (Lieutenant Commander), October 21, 1899.

July 18, 1903, he was detailed to duty at the Pensacola Navy Yard after a long service at sea. He was also in command of the naval hospital at that station. He is survived by his wife and two daughters.

The funeral services were held at the surgeon's quarters at the navy yard, May 20, and the body was escorted with full military honors to the railroad station in Pensacola, and shipped to his home in Harrisonburgh, Va., for interment.

Dr. Harris was held in the highest esteem by his associates and brother officers, and by his death the medical corps of the Navy lost a capable and efficient officer with a highly creditable record of eighteen years' service afloat and ashore.

Captain William Owen Davies, U.S.V., an active member of the Association, died at Philadelphia, May 26, 1905.

He was born in Slatington, Pa., the son of Griffith R. and Catherine Davies. His preliminary education was received in the public and high schools of Slatington. He was graduated from the Philadelphia College of Pharmacy with the degree of Ph. G., in 1888 and then entered the department of medicine of the University of Pennsylvania, Philadelphia, from which he was graduated in 1892. He practiced in Luzerne County, Pa., and was the first vice-president of the Luzerne County Medical

Society. During the latter part of 1898 he was house surgeon in St. Joseph's Hospital, Denver, Colo. On December 19, 1898, he entered the Army as Acting Assistant Surgeon and was ordered to Fort Duchesne, Utah, where he served until February 19, 1900. His contract was annulled February 22, 1900, and a new one entered into at San Francisco, Cal., on February 23, 1900.

Dr. Davies served at the Army General Hospital, San Francisco, Cal., until February 26, when he went on duty on the



Captain William O. Davies.

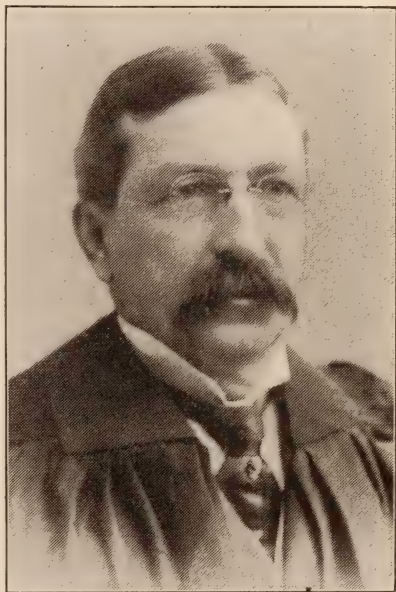
U.S.A. Transport *Thomas* to the Philippine Islands, and where he arrived on March 29, 1900. He served on those Islands as a contract surgeon until March 23, 1901, when his contract was annulled to enable him to accept a commission as Captain and Assistant Surgeon, U.S.V., which commission he held until October 15, 1902, when he was honorably discharged and returned to his home in Pennsylvania. His contributions to medical literature comprise a paper on Exophthalmic Goitre read before the Luzerne County Medical Society in 1896 and a

report of an operation of Enterocystostomy about November, 1901. He was a member of the Military Service Institution.

Lieutenant Colonel John Williams Streeter, I.A.G., an active member of the Association, died at his summer home, Upper Cross Farm, near Lake Forest, Ill., June 4, 1905, from spinal paralysis after an illness of several years, aged 63.

He was born in Ashtabula County, Ohio, September 17, 1841, son of Sereno Wright and Mary Williams Streeter. His pre-

liminary education was received at the Monroe Academy, Monroe County. After teaching school for four years he attended the University of Michigan, Department of Medicine and Surgery, Ann Arbor, for one year and then went to the Hahnemann Medical College, Chicago, from which he was graduated in 1868. At the outbreak of the Civil War he enlisted with the First Michigan Light Artillery, the famous Loomis Battery, and was made Quartermaster Sergeant, U.S.V.A. in May, 1863; was commissioned Second Lieutenant, U.S.V.A., September, 1864, and First Lieutenant in the same branch of the service, in May, 1865. From 1876 until his retirement on account of ill health he was Professor of Gynecology at the Chicago Homeopathic Medical College for twelve years, of which he was one of the founders; he was attending gynecologist to the Cook County Hospital and for ten years President of the homeopathic staff of that institution; for twenty-five years attending Gynecologist at the Chicago Homeopathic Hospital and for thirteen years chief of the staff of the Streeter Hospital which he founded in 1888.

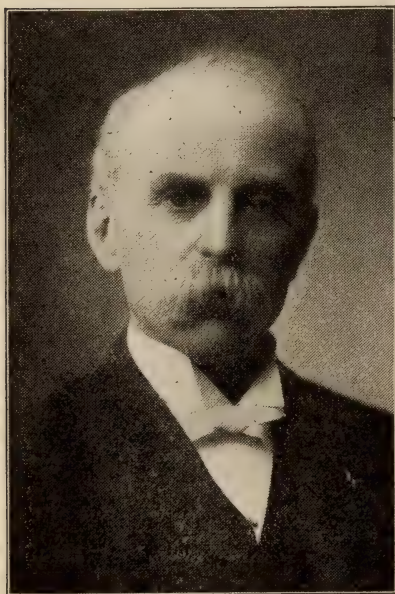


He entered the Ill. N. G. in November, 1873, being commissioned Captain and Assistant Surgeon and assigned to the First Regiment. He was Lieutenant Colonel John Williams Streeter. commissioned as Major and Surgeon of the same command, May 10, 1882, served as Major and Brigade Surgeon of the First Brigade, Ill. N.G. from November 8, 1882, to March, 1893 and was made Lieutenant Colonel and Assistant Surgeon General of the Ill. N.G. on April 22, 1898.

About ten years ago during an operation he received an infected wound from which he never recovered. His health failed so that he was obliged to retire from practice and his illness compelled him to spend the most of his time at his country home where he eventually died. During the years of his invalidism he devoted himself to literature as a recreation and wrote his famous books "The Fat of the Land" and "Dr. Tom" during this time.

Colonel O. Wellington Archibald, M.G.H.D., an active member of the Association, fainted while taking a bath at his home in St. Paul, Minn., July 28, and was drowned, aged 60.

He was born at Stillwater, Nova Scotia in 1851, graduated in medicine at the College of Physicians and Surgeons, Keokuk, Iowa, in 1870, and the Missouri Medical College in 1872. He served as Acting Assistant Surgeon, U.S.A., at Fort Baker, Montana in 1874 and later at Fort Abraham Lincoln after which he devoted his time and attention to the building up of institutions for the treatment of the feeble-minded. He established the Hospital for the Feeble-minded at Glenwood, Iowa, and afterward built up and developed the North Dakota Hospital for the Insane at Jamestown.



Colonel O. Wellington Archibald. In 1895 he was Commissioned Surgeon General of North Dakota with the rank of Colonel. In the same year he located in St. Paul, Minn., and as an eye, ear, nose and throat specialist rapidly built up one of the best practices in the city. He was a member of the American Medical Association, Minne-

sota State Medical Society and the Ramsey County (Minn.) Medical Society.

He had been ailing for three or four days and about midnight July 28th arose and went to the bathroom to take a plunge. The attention of his attendant was attracted by peculiar noises in the bathroom and on entering to investigate he found that Dr. Archibald was dead.

Acting Passed Assistant Surgeon Francis Vincent Greene, U.S.N. (retired), an active member of the Association, died at his residence, 39 S. 19th St., Philadelphia, October 9, 1902, aged 74.

He was born in Philadelphia, July 25, 1828, son of James Montgomery Greene, M.D., Medical Director, U.S. Navy, and Catherine A. Waltman. He was educated at Dr. Faire's School, Philadelphia, after that at Mount St. Mary's College, Emmetsburg, Md., where he was graduated with the highest honors. After his graduation he returned to Philadelphia and entered the Department of Medicine of the University of Pennsylvania and was duly graduated. His first hospital experience was at the St. Joseph's Hospital. He entered the Navy as Acting Assistant Surgeon, December 19, 1862 and became Acting Passed Assistant Surgeon on August 14, 1865. His first duty was with the Pacific Squadron where he served for three years. He then returned to Philadelphia for one year and served for three years with the Asiatic Squadron. His last sea duty was on the Flagship *Lancaster* with the South Atlantic Fleet. On this voyage he had a remarkably trying experience with yellow fever as, of the three surgeons aboard, two died from the disease leaving him in entire charge of 450 officers and men.

While in South America he had the opportunity of obtaining Jaborandi, Jurubebia and Guarana, regarding the therapeutic properties of all of which he wrote a number of papers for the *Medical Times* of Philadelphia, the *American Journal of Pharmacy* and other medical periodicals. Several of these articles were reprinted in the German and other foreign medical journals.

Dr. Greene's shore duty was at Washington, Brooklyn and League Island Navy Yards. During the Centennial Exhibition

in 1876 in Philadelphia, he was in charge of the medical and surgical exhibit of the Navy department. He was placed on the retired list June 30, 1879.

Contract Surgeon Frederick Wilber Richardson, U.S.A., an active member of the Association, died at Liago, Albay, Philippine Islands, January 26, 1905, from accidental wood alcohol poisoning.

Frederick Wilber Richardson was born in Hudson, St. Croix County, Wisconsin, the son of John R. and Florilla E. Richardson. His preliminary education was received in the public schools. He commenced the study of medicine under the tutorship of Dr. Samuel C. Johnson, Hudson, Wis., afterwards attending Bellevue Hospital Medical College, New York City and was graduated from the Long Island College Hospital in Brooklyn in 1885. He practiced after this in St. Paul, Minn. On January 5, 1901, he accepted a contract as Acting Assistant Surgeon in the United States Army, and was assigned to temporary duty at the Army General Hospital, Presidio of San Francisco, California, until January 15, 1901, when he was assigned to duty on the U.S.A. Transport *Grant* en route to the Philippine Islands. He arrived in the Philippine Islands, February 13, 1901, and served in those Islands until his death.

Major Joseph Bellamy Whiting, Jr., M.C. Wis., Assigned First Infantry, an active member of the Association, died suddenly at his home in Janesville, Wis., February 19, aged 39.

He was born in Janesville, October 23, 1865, son of Joseph Bellamy and Amorette Theresa Dimmock Whiting. He received his preliminary education at the public schools of Janesville and the Janesville High School and later was a student at Milton College. He then entered the Medical Department of the University of Illinois, Chicago, and was graduated from that institution in 1887. On account of his proficiency in surgery he was selected by Dr. Senn as his interne and house surgeon in his service at the Passavant Hospital, Milwaukee, and served there for a year. He then entered private practice in Janesville, and soon became known as an able surgeon.

His military service began in 1879 when he was a drummer boy in "A" Company, 1st Regiment, Wisconsin N.G. in which capacity he served for four years. He was enlisted on June 6, 1883 in "A" Company and was commissioned Captain and Assistant Surgeon in the Wisconsin N.G., February 23, 1889. At the outbreak of the Spanish-American War he went to the front with his regiment and was commissioned Captain and Assistant Surgeon, 1st Wisconsin Infantry, U.S.V., and served from May 1, to September 6, 1898 when his regiment was mustered out of the service. He then immediately entered the Army as Acting Assistant Surgeon and served with the Signal Corps in Cuba from December 15, 1898 to May 3, 1899. His contract was annulled on June 11 of the same year.

On June 17, 1899, he was commissioned as Major and Surgeon, Wisconsin N.G., and assigned to duty with the 1st Infantry and continued in this work up to the time of his death.

Captain William Hendry, O.N.G., an active member of the Association, was killed in a railway accident while en route with his command to the Presidential Inauguration in Washington, March 3, 1905, aged 31.

He was born in Madison, Lake County, Ohio, September 16, 1873, son of Francis and Sarah Ives Hendry. He received his preliminary education in the high and normal schools of Madison. He attended Oberlin College but did not graduate on account of discontinuing his attendance. He became a traveling salesman for Stalcomb, Hendry & Co., wholesale grocers of Cleveland, for a year and a half, and then traveled for a year and a half for Francis Wilder & Co., wholesale tea and coffee dealers of Cleveland. In 1893 he entered the medical department of the Western Reserve University of Cleveland and was graduated from that institution in 1896. He was assistant at the medical and gynecologic clinics of St. Vincent's and the Lakeside hospitals for a time while a student. He was an interne at St. Vincent's Hospital from 1896 to 1897.

Dr. Hendry enlisted as a private in the Cleveland Grays (an independent infantry organization) in 1895 and served three

years. On July 22, 1899, he was commissioned as Captain and Assistant Surgeon and assigned to the Cleveland Battalion of Engineers, Ohio National Guard, and continued in the service up to the time of his death. He was twice on strike duty with the state troops and on duty for two years at the annual encampment of the Ohio National Guard.

Captain Walter L. Taylor, O.N.G., an active member of the Association since December 3, 1894, died suddenly in Brooklyn, N.Y., May 9, 1905, from cerebral hemorrhage, aged 85.

He received his degree of Master of Arts from the University of Edinburgh and took his medical course at the same institution being graduated in 1840. He afterward obtained his degree as Fellow of the Royal College of Surgeons, Edinburgh. He came to America and settled in Cincinnati and was given a certificate by the Board of Medical Examiners in 1895 under the years of practice stipulation of the medical practice act.

He was commissioned as Captain and Assistant Surgeon, O.N.G., January 8, 1894, and assigned to the Second Troop of Cavalry.

He was a pleasant affable man, an able physician and surgeon, doing a large amount of operative work, especially gynecological.

Lieutenant Clarkson Crosby Schuyler M.G., M.D., an active member of the Association since April 25th, 1894, died of cirrhosis of the liver at his home in Plattsburgh, N.Y., August 16, 1905, aged 55.

He was born in White Plains, Westchester County, N.Y., September 17, 1856, son of Thomas Hook and Angelica Aspinwall Schuyler, of a family of prominent distinction and early settlers of the State. He received his early education in the public schools of Port Schuyler and in business college in that place. He then acquired appointment on the clerical staff of the Watervliet Arsenal of Troy and while thus employed began the study of medicine, working evenings in the office of his preceptor, Dr. Sabin. He entered Albany Medical College and was graduated with honors in 1875 and after graduation, he became assistant to Dr. LeRoy McLean of Troy, but on account of ill health, he was compelled to abandon active practice and went to Europe where

he made a special study of diseases of the nose and throat under Sir Morell Mackenzie. On his return to Troy, Dr. Schuyler entered upon the practice of his specialty in which he attained marked success. He was for fourteen years a member of the staff of the Troy Hospital. From 1893 to 1895 he held the position of New York State Forest Commissioner.

He was commissioned First Lieutenant and Assistant Surgeon of 6th Separate Company (Troy Citizens Corps) N.G.S., N.Y. August 23, 1883 and served in that capacity until February 11, 1891 when he was commissioned First Lieutenant and Assistant Surgeon N.G., N.Y., and retired from the service with this rank.

In December, 1899, he received the appointment of State Commissioner to the World's Exposition in Paris. On account of the failing health and subsequent death of his father-in-law, Dr. Schuyler was compelled to give up his practice and take up his residence in Plattsburgh, that he might look after the extensive interests of the estate.

He died at his home in Plattsburgh from cirrhosis of the liver August 16, 1905.

Captain Guy C. M. Godfrey, U.S.A., an active member of the Association, died from the effect of a self-inflicted gunshot wound of the head at his quarters in Fort McPherson, Atlanta, Georgia, September 23, while temporarily insane, aged 34.

He was born October 12, 1870, the son of Colonel E. S. Godfrey, United States Army, was graduated from the College of Physicians and Surgeons in Baltimore in 1892, was appointed Assistant Surgeon United States Army from the State of Ohio with the rank of First Lieutenant May 12, 1893; accepted commission May 15, 1893, and was advanced to the rank of Captain October 24, 1898. He served as follows: At Fort D. A. Russell, Wyo., to March 24, 1897; At Fort Sheridan, Ill., to December 20, 1897; At Fort Mott, N. J., to April 21, 1898; At Chickamauga Park, Ga., to April 30, 1898; At Port Tampa, Fla., to June 27, 1898; In Cuba, with the 5th Army Corps, to September 2, 1898; Returning to the United States and on sick leave, to October 31, 1898; At Huntsville, Ala., to November 28, 1898; At Macon, Ga., to January 10, 1899; At Havana, Cuba, to September 12, 1899;

At Pinar del Rio, Cuba, to September 23, 1900; En route to Philippines, to January 4, 1901; In Philippine Islands, to July 15, 1903; Returning to United States, and on leave of absence, to October 12, 1903; At Fort Apache, Ariz., to September 3, 1904; At New York City, to July 29, 1905; At Fort McPherson, Ga., to September 23, 1905, date of death.

THE SWEDISH BARRACKS.

IN consequence of the reorganization of the Swedish army, says Division Surgeon Sörenson (*Tidskr. i mil. Hälsovård*), a proportionately large number of new barracks are to be built at a total cost of forty-eight million kroner. These barracks are to be constructed as follows: An infantry barracks is to consist of an administration building, three buildings for the soldiers and non-commissioned officers, a drill house, a kitchen, a bath house, a pavilion for the sick, a stable and coach house and two sinks. The administration building is a three story building and contains a watch room, a prison room, a mess room for the non-commissioned officers, offices, a ward room, and accommodations for unmarried officers and for applicants for a Lieutenant's commission. The kitchen building is built of wood and contains a dining hall for 600 men. The bath house contains a steam bath, disrobing rooms, douche rooms, a swimming basin, a tub bath for officers and non-commissioned officers, and wash rooms; an establishment for disinfection is to be connected with this building. The drill house is a frame building. The buildings for the soldiers are large four story edifices. On each floor are rooms for one company and its non-commissioned officers. Along one front runs a corridor from which doors lead into the soldiers' rooms,—which are intended for sixteen or eighteen men,—wash room, polishing room, living room and instruction room. In the cellar is the heating apparatus. The rooms for the men are 10 m. by 6 m. by 3.6 m., and each man has 3.75 square meters of space and 13.5 cubic meters of air. The pavilion for the sick contains quarters for a non-commissioned officer, a room for the surgeon, a waiting room and examining room, four wards for twenty-one patients, twenty-one isolating rooms, a bath room and a sink.—HANS DAAE.

THE X-RAY IN MILITARY SURGERY.

BY LIEUTENANT HARRY HALL HARTUNG,

ASSISTANT SURGEON IN THE MASSACHUSETTS VOLUNTEER
MILITIA.

SINCE the discovery of the Röntgen ray by Professor Röntgen, nearly ten years ago, when he was then professor of physics at the Royal University of Würzburg, many valuable improvements have been made in the various apparatus, tubes, etc., for producing x-ray light, until at the present time we have machines which are almost perfect.

Formerly the apparatus was large, bulky, and was not easily transported; it was complicated, the parts broke easily and frequently got out of order. Now we can obtain coil machines of great power, from eight to fifteen inch spark, which can be put up in two boxes, so that one man can carry a box in each hand, and they will take radiographs of any part of the body. Such machines are being made equally well by several of the best-known American manufacturers.

There is a wide diversity of opinion, among those engaged in x-ray work, as to what type of apparatus is the best; some prefer the static machine, some the induction coil, while others prefer the high-frequency. The choice really lies between the static and the coil. In general hospitals, where the machine is to remain stationary at all times, the static can be used; but where it has to be frequently moved from place to place, as in actual warfare, the only machine that is practical is the induction coil. This type of machine is best adapted for x-ray work pure and simple, while the static is better adapted where it is also desired to obtain electricity for therapeutic purposes. The coil should preferably be run by a dynamo or direct street current, but when these are not available, as in actual warfare, they can be run by cell batteries or storage batteries.

The induction coil is the ideal machine for military purposes, for the following reasons; it is light in weight, occupies a small amount of space, and for these reasons is easily transported from place to place; it has its advantages over the static, in that it is simple in construction, practically never gets out of order, and is not influenced by atmospheric changes.

The medical department of the United States army, as well as that of many of the European armies, has been experimenting with the x-ray in military surgery; and some of them have had actual experience in war, notably the English and German medical officers, in the Græco-Turkish war; the British in the Soudan and Terrah expeditions; the Boer war; the Japanese-Chinese war; the Spanish-American war; and the recent Russian-Japanese war.

The medical department of the German army has a portable field apparatus, which resembles the ammunition boxes used by the artillery, and is easily moved about from place to place; this apparatus is one of the best that has yet been devised for use in the field.

The Græco-Turkish war of 1897 was followed by Professors Kuttner of Tübingen and Abbott of London. Professor Kuttner, who went in connection with the German Red Cross Society, has stated, as a result of his experience with a Röntgen apparatus in that war, that it is of great value for medical aid in war, but only for fixed hospitals and those established in fortresses, while for movable hospitals their application is very limited.

Abbott states that a coil battery apparatus was used at the base hospital at Phalerum, and, as a result of his experience in that war, he says: "The use of the Röntgen ray becomes an impossibility at the front. Fortunately, it is unnecessary there, and could possibly do harm by stimulating the young surgeon to premature operations under bad surroundings." He believes that the x-ray in future wars will be of the greatest value, but not at the front. The apparatus is of no use on the field, where the detection of bullets can only be an incentive to premature exploration. The less wounds are tampered with before satisfactory surroundings are reached, the better. The modern bullet is

practically aseptic, and there is no urgency for its immediate removal except in rare cases.

Surgeon-Major Jameson of the medical department of the British army, in discussing the use of the x-ray in warfare, as used by the British medical department, says: "Reference has been made to the necessity of supplying these various apparatus to the hospitals at the front, but the difficulty of transport must really be considered. It seems to me that, from our present knowledge, the advantages are not so very great after all in that part. The place for them is in the line of communication and at the base or general hospitals, because, after all, nothing except very urgent operations are advised to be performed in advanced places. What the photography really determines is more the position of the bullet or the kind of fracture, but the urgency of operation is determined by other conditions."

Professor von Bergmann, who obtained such brilliant results in the Turko-Russian war by the use of occlusive dressings, and who has since advocated the use of such dressings and non-interference in gunshot wounds, has expressed the opinion that the Röntgen ray will prove a menace in military surgery, in that it will prove an incentive to unnecessary operative interference. In a recent clinical lecture he said: "After many years practice in peace and war, I maintain that foreign bodies, the presence of which in the body is not a source of any trouble or danger, ought to be left where they are. This is especially true in case of war, where it is often impossible to operate with all aseptic precautions."

Soon after the discovery of the Röntgen ray, the Surgeon General of the United States army supplied x-ray apparatus to several of the larger post hospitals; at the outbreak of the Spanish-American war and the establishment of general hospitals, the most important of them, and the three hospital ships, *Relief*, *Missouri* and *Bay State*, were supplied with similar appliances. In all seventeen apparatus were available during the war, of which five were static and twelve were coil machines. These proved to be not only invaluable aids in military surgery, but the use of the two types, coil and static, gave an opportunity for the

comparison of the two methods for producing the Röntgen ray as adapted to the needs and environments of military hospitals.

The use of the Röntgen ray has marked a distinct advance in military surgery; it has favored conservatism and promoted the aseptic healing of bullet wounds made by lodged missiles, in that it has done away with the necessity for the exploration of wounds by probes or other means, and by this obviated the dangers of infection and additional traumatism in this class of injuries. In gunshot fractures it has been of great scientific value, by showing the character of the bone lesions, the form of the fracture and the amount of bone comminution produced by the small-caliber and other bullets,—conditions which could not have been otherwise determined in the living body. In the treatment of these traumatisms it has been of the greatest value in determining the course of treatment to be pursued; and its use, together with the course of the cases under treatment, has shown that the aseptic or septic condition of the wound is of far greater importance than the amount of bone comminution. This is illustrated by those cases of extensive bone comminution which, when connected with aseptic wounds, progress to favorable termination with a minimum of immediate and remote ill effect; while those cases in which bone traumatism is slight, if complicated by infection of the wound, are much more difficult to treat and serious in their result.

In the Spanish-American war, apparatus was supplied to general hospitals and hospital ships only; none were used in movable hospitals or in the field. Some advocates of the x-ray in military surgery have advised the use of apparatus in the field hospitals. In the Terrah expedition an apparatus was used at the extreme front,—so far to the front that the operators were at one time under fire when engaged in removing a bullet with its aid.

The x-ray has played an important part in allowing the surgeon to preserve the asepticity of bullet wounds, by doing away in many cases with the necessity for immediate wound exploration, especially for lodged bullets. The many cases of lodged bullets in which they were left undisturbed until the patients reached a general hospital or hospital ship, where the missiles

were located by the x-ray and removed under aseptic conditions with complete safety to the patient and rapid recovery, prove the non-necessity for the use of the x-ray apparatus in the field or other advanced hospitals. Even where the bullet can be readily located without the use of the x-ray, the experience of the recent wars and the opinion of numerous authorities lead to the conclusion that the zeal of the surgeon should not cause him to remove the missile at the field hospital except in special cases. Infection is almost sure to occur from the almost absolute impossibility of obtaining asepsis under conditions which are present at the front; and the recovery of the patient is delayed and the functions of the wounded part likely to be impaired in consequence of the suppuration which will follow.

As to the use of the x-ray in gunshot fractures, the same rules hold as for lodged missiles; *i. e.*, occlusive dressings and non-interference at the field hospitals, except where operation is imperatively demanded. And in this connection it may be stated that cases of gunshot fractures are extremely infrequent which can be benefited in any way by the use of x-ray apparatus at the front.

Through the courtesy of Dr. Anita Newcomb McGee of St. Louis, Mo., who recently returned from Japan, where she had charge of the Japanese army nurses, I am enabled to give some very interesting and valuable information in regard to the use of the x-ray in the recent Russian-Japanese war. She informs me that x-ray apparatus is used only in general hospitals and hospital ships; that, as far as she knows, there is no movable field apparatus.

"The Japanese surgeons are very strict about not operating in the field, unless the case absolutely requires immediate operation to save life. Patients are transported to Hiroshima, Japan, where there is a general hospital that can accommodate from 15,000 to 18,000 sick and wounded. Here operations are continuous, and x-ray photographs are taken in large numbers. At the fixed field hospitals that I saw there were no x-ray outfits; and, although I cannot speak positively, I have every reason to believe that none are carried with the army. A few of the hos-

pital ships have them, but they are seldom used, as only a rare emergency case is operated on. I saw an x-ray room on the naval hospital ship '*Kobe-Maru*,' and as it is a floating hospital, remaining with the fleet, the outfit is no doubt used on it. It would be much more useful there than on army ships, which are primarily for transportation purposes only."

The Surgeon General of the United States army kindly furnished me with the following facts with regard to the present use of x-ray in the medical department of the United States army. A type of machine which is sufficiently portable to be used at base hospitals in the field is now being made, and will shortly undergo experimental trial. It consists of a motor with a small dynamo and coil apparatus. The dynamo could also furnish electric light for the operating room, if required. A small static machine, which was portable and intended for use at base hospitals, was issued just after the Spanish-American war, but was not very efficient. The proposition to furnish such apparatus for use in field hospitals has been suggested, and was even provided for in the "Medical Manual" of 1902, but it has been found to be impracticable.

The results obtained from the experience of various military surgeons during the recent wars have been very valuable, and have determined to a great extent the usefulness, value and practicability of the x-ray in military surgery, and will undoubtedly determine to a great extent the advisability of equipping all general hospitals and hospital ships in the future with x-ray apparatus.

In considering where the Röntgen apparatus is to be placed for use in military surgery in time of war, the fact must be taken into consideration that the apparatus is all more or less bulky, heavy, somewhat difficult to transport, and that its use requires considerable experience and skill, and at field hospitals necessitates expenditure of time when surgeons are most busy with work incident to active operations. These disadvantages, however, should not be considered were the benefits to be derived from the employment of the apparatus in field hospitals at all in proportion to the difficulties incident to its transportation and

use; but when the benefits to be derived from use at advanced hospitals is confined to extremely few if any cases, and the apparatus is useless in all others, the time, work and transportation expended under such circumstances can be better employed elsewhere. Among other things to be considered in connection with the x-ray in field hospitals is the fact of the difficulty of carrying and preserving photographic plates; also, provision must be made for a dark room or a suitable place to properly develop the x-ray plates, all of which things add to the difficulty of the situation. These difficulties can be quite readily overcome at a general hospital, but not so in the field.

The experience of the surgeons in the Spanish-American war seems to fully agree with those of other nations, as the use of the x-ray apparatus at general hospitals and on board hospital ships met all practical requirements.

The conclusions reached as a result of the experience of various surgeons during the past seven years with regard to the use of the x-ray in military surgery are:—

First—The use of the Röntgen ray has marked a distinct advance in military surgery, and in the future it should form a part of the equipment of the medical department of all armies.

Second—Its use in field hospitals is not practical or advisable, but it is of great value at general hospitals and on hospital ships.

Third—In equipping general hospitals and hospital ships, the best and most satisfactory apparatus to be installed is the coil machine.

In concluding, I wish to express my thanks to Surgeon General Robert M. O'Reilly, U.S.A., Captain W. C. Borden, U.S.A., and Dr. Anita Newcomb McGee, who have so kindly assisted me with valuable information in preparing this paper.

Contemporary Comment.

RANK AND COMMAND IN THE JAPANESE ARMY MEDICAL SERVICE.

IN the *Journal of the Royal Army Medical Corps*, Lieutenant Colonel W. G. Macpherson of the British Services notes that much of the military work proper of the Medical Department of the Japanese Army is performed under the direction of other than medical officers. Between the fighting units and the field hospital, for example, are bearer battalions, each commanded by a Major of Infantry or Train. The transport department for the sick and wounded, and the medical and surgical reserve depots, are under similar direction. It is to be noted also that the medical officers of the Japanese Army do not have the military titles of the same grades as their brethren of the line, although they have the rank. The commissioned grades of the Japanese Army Medical Department are:

Gun-i-cho-kan (Director General—Lieutenant General); *Gun-i-kan* (Surgeon General—Major General); *Itto-Gun-i-sei* (1st Class Senior Surgeon—Colonel); *Nito Gun-i-sei* (2nd Class Senior Surgeon—Lieutenant Colonel); *Santo Gun-i-sei* (3rd Class Senior Surgeon—Major); *Itto-Gun-i* (1st Class Surgeon—Captain); *Nito Gun-i* (2nd Class Surgeon—Lieutenant); *Santo Gun-i* (3rd Class Surgeon—Second Lieutenant).

The enlisted force consists of:

(1) *Gun-i-ko-ho-sei* (Surgeon on probation); (2) *Itto Kango-cho* (1st class Hospital Sergeant); (3) *Nito* and *Santo Kango-cho* (2nd and 3rd class Hospital Sergeant); (4) *Kango-shu* (Hospital Corporal); (5) *Yaku-zai-shu* (Compounder); (6) *Kango-sotsu* (Hospital orderly); (7) *Mako* (Instrument repairer); (8) *Kango-nin* (Civil male nurse); (9) *Kango-fu* (Female nurse);

(10) *Tanka-Sotsu* (Stretcher-bearer); (11) *Hojo-Tanka-Sotsu* (Assistant Stretcher-bearer).

These men are not recruited direct for the medical service, but from men serving with the colors who are in their second year of service, and who pass into the reserve after suitable training. The bearer battalions, etc., are formed from these reserves in case of mobilization for war, but none of them do duty as hospital attendants, their places being taken in peace by "a class of men who are not of sufficient height, age or physique for military service, but who are trained as sick nurses; they are not enlisted soldiers but are simply civil employees of the army." In time of war they form a large proportion of the attendants in the line of communication hospitals, their places being taken in the base hospitals by the Red Cross nurses.

ANESTHESIA FOR THE WOUNDED.

IN a recent pamphlet (Berlin, Julius Springer) Schleich proposes that every soldier in the field be provided with a means by which, in case he is wounded, it may be possible to produce a narcotic sleep which would alleviate his sufferings until other help arrived. The remedy most suitable for this purpose is believed to be a mixture of chloroform, ether, and ethyl chloride with a boiling point closely approximating that of the temperature of the body. This combination has been used as a general anesthetic by Schleich and others in all classes of cases with good results. It is claimed to possess an anodyne action and the power of producing sleep without inducing a true narcosis, and therefore seems particularly adapted to the purpose for which it has been recommended. For practical use the remedy is to be carried about in small aluminum capsules containing absorbent cotton which has been saturated with the narcotic mixture. Each soldier is to be provided with three capsules, and when wounded he is directed to withdraw the cork from one of these small receptacles and simply inhale the narcotizing vapor. Or he may act as the ministering angel to some other unfortunate who may be unable to perform this feat himself.—*Medical Record*.

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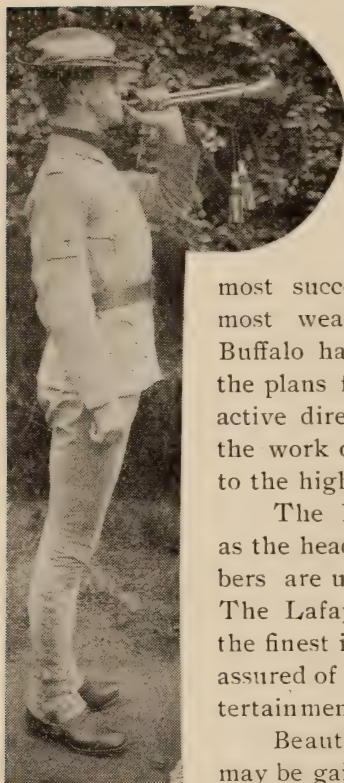
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Editorial Expression

THE BUFFALO MEETING.



THE work of preparation for the Fifteenth Annual Meeting of the Association at Buffalo, September 11-14, is well advanced. As might be expected the Committee of Arrangements, under the inspiration of the President, has been

most successful in its work. Many of the most wealthy and influential citizens of Buffalo have become actively interested in the plans for the meeting, and under such active direction and enthusiastic sympathy, the work of preparation is sure to proceed to the highest advantage.

The Hotel Lafayette has been selected as the headquarters of the meeting and members are urged to secure rooms in advance. The Lafayette is a new house, and one of the finest in the country, where members are assured of obtaining the highest grade of entertainment.

Beautiful Buffalo, an inkling of which may be gained from the plates accompanying this article—for which we are indebted to the courtesy of the Buffalo *Express*—will be at her best. Among the social functions will be a Public Reception at the Lafayette on Tuesday evening, and a Men's Reception at the Buffalo Club on Wednesday, with one or two luncheons during the meeting. Thursday

evening will be left open for individual entertainments, the plan found so satisfactory last year at Detroit.

On Friday will occur the great trip to Niagara, which will undoubtedly be the most sumptuous entertainment ever given to the Association. Opening with a sail about the harbor of Buffalo and down the river to Niagara, a luncheon will be tendered the Association by the National Food Company of Niagara Falls, whose general manager, Major M. B. Butler, commands the First Battalion N.G.N.Y.; the trip will then be resumed by rail down the Gorge of the Niagara and return. The excursion will include views of historic fields, such as the ruins of old Fort Erie; the battlefields of Lundy's Lane, Chippewa and Queenstown Heights; and the Devil's Hole, scene of bloody conflicts between the British on the one side and the French and Indians on the other in colonial days.

The official foreign representation at the meeting will be large and distinguished,—the Association having been advised that the British Army will be represented by Colonel W. G. Macpherson, R.A.M.C. who made so enviable a record as an attaché with the Japanese forces during the Russo-Japanese War, while the British Navy and the East Indian service will also be represented by suitable delegates. Lieutenant Colonel Alejandro Ross will again take part in the program as the representative of our sister nation on the south, and Colonel Henri Mareschal has been for the third time, nominated as delegate from our sister republic in Europe; the French government has also, in orders, authorized all medical officers of its military service, who desire to do so, to attend the meeting. Nicaragua will be represented by Dr. J. Lisandro Medina, and the Turkish government by one of its Secretaries of Legation.

Arrangements are in course of consummation for the extension of the usual special railroad rates to the Association, full details of which will be published in the next number of the JOURNAL.

The scientific program for the meeting is well advanced and will include the following contributions. A number of other papers are in course of preparation the titles of most of which, the Literary Committee hope to be able to announce next month.

Laboratory Work Aboard Ship. By Passed Assistant Surgeon Alfred William Balch, U.S. Navy.

An outline of the method of microscopical and chemical examinations especially adapted for use on naval vessels.

The Army Medical Department at the San Francisco Earthquake Disaster. By Dr. Henry du Rest Phelan, U.S. Army.

An account, from personal observation, of the work done by the Army Medical Department at San Francisco, by a member of the Association who was at that time in civil life and has since been reappointed to the military service.

The work of the Hospital Corps of the Oregon National Guard at the San Francisco Disaster. By Captain William E. Carll, Oregon N.G.

A noteworthy account of the work done by a national guard organization in connection with the earthquake at San Francisco.

Proposal for a National Medical Service or Department of Public Health. By Surgeon Sheldon Guthrie Evans, U.S. Navy.

Simply a proposition to combine the Medical Departments of the Army, Navy, Public Health and Marine Hospital Service, and all federal medical positions, into one organization headed by a Secretary of Public Health.

Some Phases of Military Medical Work in Manchuria. By Colonel John Van Rensselaer Hoff, U.S. Army.

Experiences with the New York Volunteer Cavalry during the Spanish-American War. By Captain Médwin Leale, N.G.N.Y.

A vivid and interesting account of the work of the Medical Department of the New York Volunteer Cavalry during the Spanish-American War, including its work at Camp Alger and Porto Rico, with an account of its conduct of affairs on transport and en route to and from the latter place.

The Workings of the Ancon Hospital, Isthmus of Panama. By Major John L. Phillips, U.S. Army.

The Bravery of the Medical Officer. By Major James Evelyn Pilcher, U.S.V., Captain U.S. Army.

The enemies of mankind always under attack by the medical practitioner, whose life is not infrequently sacrificed to his dauntless zeal in conquest. The history of military medicine shows many instances of this type of bravery. That lesser degree of bravery however, which has been re-

warded by special insignia, such as the several crosses of the European nations and our own medal of honor, has been largely displayed also by medical officers who form a disproportionately large number of those upon whom such decorations have been conferred.

Military Medical Chest for use on Mountainous Roads. By Lieutenant Colonel Alejandro Ross, Mexican Army.

A description of a medical chest devised by a distinguished medical officer of the Mexican service.



The Albright Art Gallery, Buffalo, N. Y.

Note on the Sanitary Condition of the Imperial Japanese Army during the Late Russo-Japanese War. By Surgeon General Shigemichi Suzuki, Imperial Japanese Navy.

This note has been prepared by the author in response to many questions which have been put to him with regard to the sanitary conditions during the late war in the orient, and is an authoritative statement upon the subject.

Note on the Military Medical Service of the Teutonic Order.
By Stabsarzt Dr. Johann Steiner, Austro-Hungarian Service.

A Consideration of Recent Views on the Work of the Medical Department in Naval Warfare. By Medical Director John Croprier Wise, U.S. Navy.

Recent expressions of opinion. The impracticability in the present status of naval tactics of exactly formulating the wants of the medical department of a ship in action. If the available point for a hospital with space, light and penetration has not yet been found, and if we possessed it and it be conceded that we cannot get our wounded to it in action, does not the matter become one of minor importance? The writer maintains that the wisest commander will leave the disposition of the personnel of the medical department to the discretion of his senior medical officer.

The Medical Officer and the Line—A Reminiscence. By Major R. S. Woodson, U.S. Army.

An interesting account of the author's experience with the line in matters of sanitation.

Report of an Epidemic of Cerebro-Spinal Meningitis at the U.S. Naval Training Station, Newport, R. I., with a Discussion of the Disease in Relation to Military Establishments. By Surgeon Norman Jerome Blackwood, U.S.N., Surgeon Middleton Semmes Guest, U.S.N., Passed Assistant Surgeon John Hooe Iden, U.S.N. and Passed Assistant Surgeon John Land Neilson, U.S.N.

History of the epidemic. Clinical picture of the cases. Bacteriological and postmortem examinations. Methods of disinfection and prevention. General remarks.

A Sanitary Scuttle-Butt. By Surgeon Manly F. Gates, U.S. Navy.

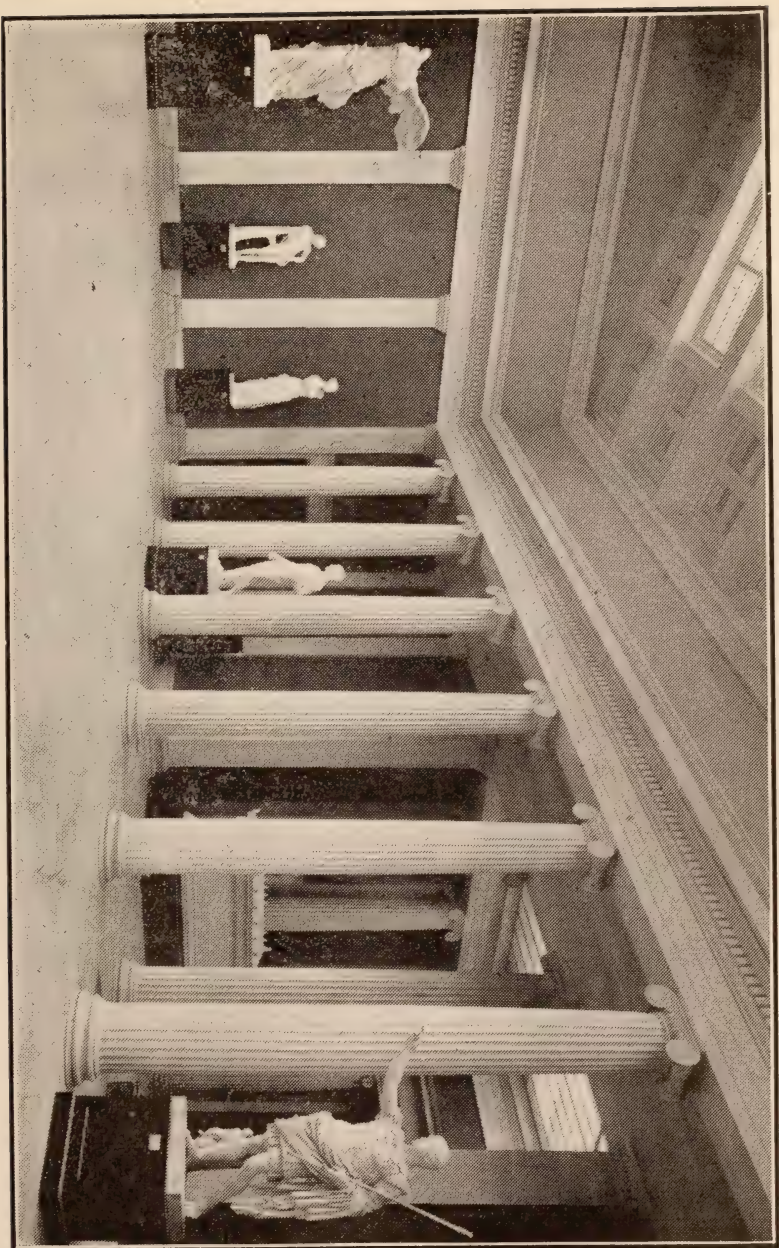
A discussion of sanitary measures aboard ship for common drinking contagions with a description of the author's sanitary scuttlebutt.

English, German and French Conceptions of Prophylaxis in East Africa. From the French of Dr. Cloaguen of the French Navy. By Major Henry S. T. Harris, U.S. Army.

A chapter from a series of remarkable observations made by a distinguished French naval surgeon during a cruise made last year on the *Capricorne* in the Indian Ocean.

The Seaman as a Patient. By Passed Assistant Surgeon C. H. Lavinder, P.H. & M.H.S.

Certain frequent morbid characteristics of the seaman,—their possible



Hall of Sculpture, Albright Art Gallery.

influence on the diagnosis, prognosis and treatment of his diseases; some of the diseases from which he suffers most; certain diseases from which he seems to enjoy a relative immunity; a possible field for preventive medicine.

Some Phases of Army Recruiting Work. By Major Henry I. Raymond, U.S. Army.

The Medical and Sanitary Questions Met in Everyday Life on a Cruising Ship of the Navy. By Medical Director Manly H. Simons, U.S. Navy.

Points out the difference between the sailor in the old navy and in the new; the great difficulty in keeping modern ships clean owing to their complexity in construction; shows some things that are desirable from a sanitary point of view and tells how various emergencies have been met aboard ship.

Tropical Hygiene in Reference to Clothing, Houses, Routine and Diet. By Passed Assistant Surgeon Allan Stuart, U.S. Navy.

This discussion includes the headgear and general clothing, detailed discussion of the housing, including the especial description of a bungalow especially adapted to tropical purposes, and diet, closing with a discussion of the routine upon marches and the use of double awnings on board ship.

The Brain a Good Field for Surgery, as Shown by its Disregard for Traumatism. By Captain Charles D. Center, Illinois N.G.

The author quotes personal experience and adduces the work of others to show that the cerebrum offers a good field for safe surgery and that such work, done early and under the usual aseptic precautions, will give as brilliant results as are now obtained in the abdomen.

Surgical Treatment of Dysentery. By Surgeon Holcomb C. Curl, U.S. Navy.

Need for interference in a certain class of cases. High death rate in this class. Simplicity of operative procedure itself. Results as to lessened frequency of stools and disappearance of ova in cases irrigated. Solutions used for irrigation; amount; reaction; etc. Spontaneous closure of sinus when irrigation is discontinued, and operative procedures for closure where needed. Review of seventeen cases operated upon by the author.

Wounds of the Colon Treated without Operation. By Major P. R. Egan, Surgeon, Retired, in the United States Army.

The author quotes three cases occurring in his experience of recovery from wounds of the colon without operation, and protests against indiscriminate laparotomy for the relief of this condition.



View on the Lower Niagara.

The Use of Mercurial Bichloride in Surgery. By Acting Assistant Surgeon Montafix W. Houghton, P. H. & M. H. S.

(1) Short history. (2) General use (sterilization). (3) Treatment of bruises, sprains and infected superficial wounds. (4) Plastic surgery (a) of the bones, (b) of the skin and subcutaneous tissues. (5) Visceral surgery—liver, kidney, etc.

The Classification and Treatment of Burns. By Surgeon Charles P. Kindleberger, U. S. Navy.

A general discussion of the subject of burns, with a special description of the injuries received during the *Bennington* boiler explosion, with high commendation of the use of picric acid solution, which is an antiseptic clean dressing, produces rapid coagulation of albumen, is not appreciably toxic, hastens rapid healing and lessens scar formation.

Firing Tests and Experiences with the Small Caliber Rifle. By Generalarzt Dr. A. Körting. Translated by Captain William Lassiter, U. S. Army.

From an exhaustive study of the subject the author concludes that a bullet which (1) necessitates many hits to put a man out of action, (2) permits a third of the wounded to reenter the struggle within three or four weeks—cannot be considered as sufficient from the military point of view. (3) Modifications of the bullet so as to increase its efficiency cannot be approved from the medical point of view, in the interest of securing the certain rehabilitation of the wounded. (4) From the practical point of view, we may conclude that the 8 mm. bullet of the German army should not be replaced by a smaller caliber.

A Case of Multiple Gunshot Wound. By Lieutenant Leon T. Le Wald, U. S. Army.

A case of penetration of four revolver bullets, particularly noteworthy on account of the lack of stopping power shown.

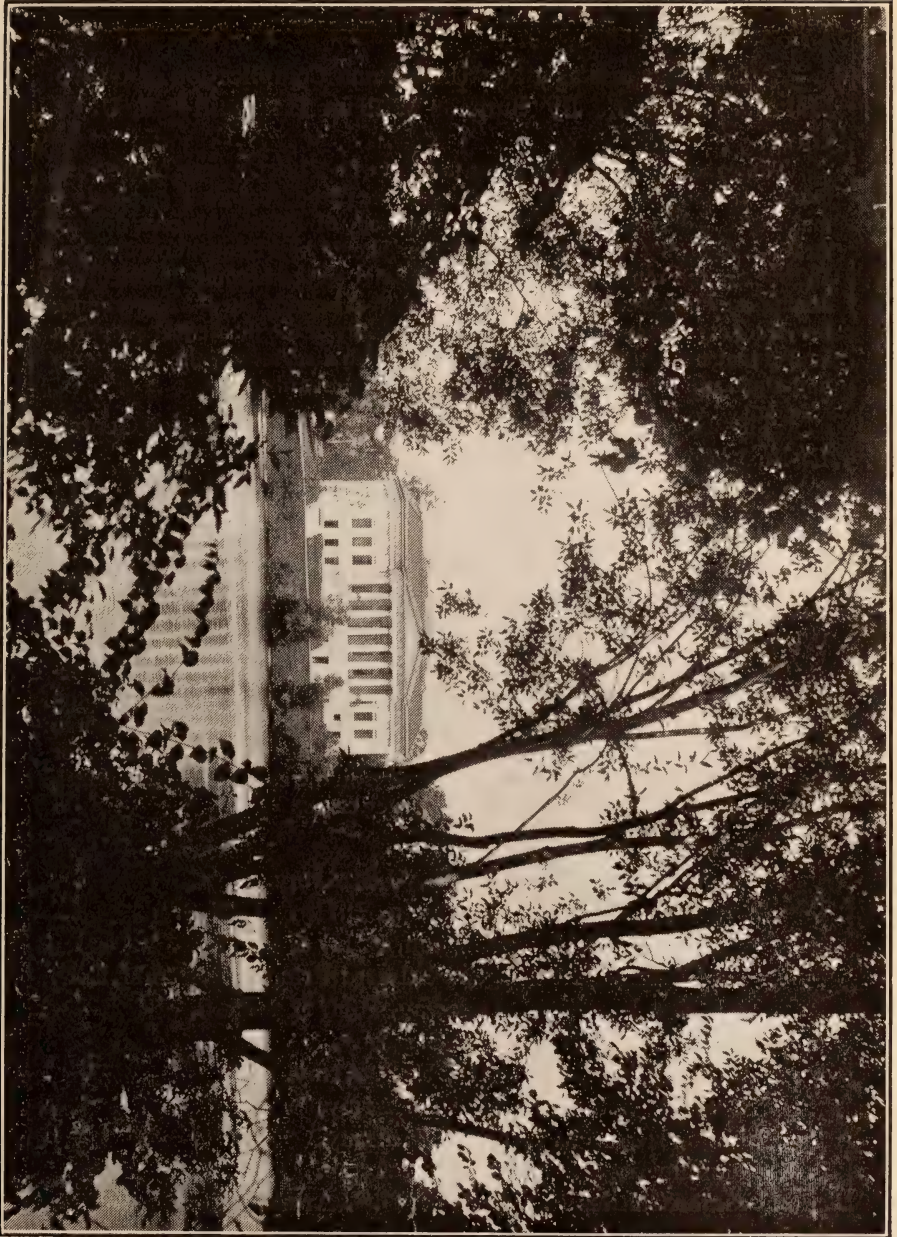
Surgery at the First Aid Station. By Colonel H. Nimier, French Army.

An exhaustive and interesting discussion of the surgery at the aid station by the Professor of Surgery in the Military Medical School at Val de Grace.

Affections of the Eye in the Military Service. By Captain Ernest L. Ruffner, U. S. Army.

A Case of Fracture of the Skull. By Captain Samuel M. Waterhouse, U. S. Army.

A case offering some features of special interest by reason of the comparatively small traumatism and the very extensive lesion resulting therefrom.



Historical Society Building.

Splenic Abscess as a Not Uncommon Complication of Grave Malarial Infection. By Surgeon William Hemphill Bell, U. S. Navy.

The paper presents three cases in point with a brief resume of the literature. It then enters upon a discussion of the pathogenesis and emphasizes malaria as a disease important in the etiology of splenic abscess, demonstrating, theoretically, why the condition should be a frequent occurrence. In tracing the route by which the malarial spleen becomes infected, examples are offered and experiments of indirect bearing cited. A procedure for direct experiment to determine the tenability of the theoretical premises is also suggested, and the paper concludes with a review of the symptoms and signs and remarks upon the prognosis and treatment.

The Climatic Treatment of Tuberculosis. By Major George E. Bushnell, U.S. Army.

The Varieties of Aestivo-Autumnal Malarial Fever. By Captain W. P. Chamberlain, U.S. Army.

The Influence of Professor Burggraave upon Modern Therapeutics; with Especial Reference to Military Practice. By Dr. William T. Thackeray, formerly U.S. Army.

Condition of materia medica and therapeutics prior to 1858. The improvements wrought by Professor Burggraave on therapeutic lines and the adoption of his ideas by the military and naval branches of the Belgium and French governments. Alkalometry in the United States. Reasons for the interest of the military and naval services in the use of the active principles. Exhibition of belt case and emergency cases.

Papers are also expected by:

Captain Bailey K. Ashford, U.S. Army.

Surgeon Preston H. Bailhache, P.H. & M.H.S.

Surgeon Paul M. Carrington, P. H. & M. H. S.

Passed Assistant Surgeon Edward Francis, P.H.&M.H.S.

Surgeon James M. Gassaway, P.H. & M.H.S.

Major Charles Lynch, U.S. Army.

Captain Theo. C. Lyster, U. S. Army.

Colonel Nicholas Senn, U.S. Army.

Major Henry A. Shaw, U.S. Army.

Captain Ira G. Shimer, U.S. Army.

Major Charles E. Woodruff, U.S. Army.

News of the Services.

THE following medical officers were elected members of the Association of Military Surgeons of the United States upon the ballot of the Executive Council of June 30th.

ACTIVE.

UNITED STATES NAVY.

Passed Assistant Surgeon Fred Macon Bogan.
Surgeon William H. Bucher.

UNITED STATES PUBLIC HEALTH AND MARINE HOSPITAL SERVICE.

Acting Assistant Surgeon Ralph Henry Sill.

NATIONAL GUARD.

Lieutenant Charles H. Bowker, N.G.D.C.
Lieutenant Charles Stanislaus Capelle, M.V.M.
Captain Walter Edward Carll, Oregon N.G.
Captain Andrew James Gilmour, N.G.N.Y.
Lieutenant William A. Gordon, Jr., Wisconsin N.G.
Captain Samuel Hall Greene, N.G. Georgia.
Lieutenant Ernest Emil Holtzen, N.G. Missouri.
Captain Morris Kahn, N.G. Colorado.
Lieutenant C. Hugh McKenna, Illinois N.G.
Captain E. J. Neathery, Texas N.G.
Lieutenant William Darracott Travis, N.G. Georgia.
Lieutenant John J. Tribble, Illinois N.G.
Lieutenant James Curtis Watts, N.G. Georgia.

ASSOCIATE.

Major John Johnson Kyle, U.S.V.

Dr. George F. Adair, U.S.A., ordered from Fort Wadsworth to Fort Slocum for temporary duty and from Fort Wadsworth to Fort Washington.

Captain John H. Allen, U.S.A., promoted from First Lieutenant, June 29, 1906.

Passed Assistant Surgeon J. W. Amessee, P.H.&M.H.S., ordered from Ellis Island to Gulfport, Miss., for temporary duty.

Passed Assistant Surgeon John F. Anderson, P.H.&M.H.S., ordered from the Washington Hygienic Laboratory to Charlotte, N.C., for special temporary duty.

Captain Bailey K. Ashford, U.S.A., ordered to accompany troops from Washington Barracks to Mt. Gretna for duty at the camp of instruction

Assistant Surgeon J. W. Backus, U.S.A., ordered to the *Franklin*.

Dr. Edward Bailey, U.S.A., granted four months leave from Fort Wright.

Dr. Charles L. Baker, U.S.A., arrived at San Francisco on the *Sheridan* on leave from Honolulu.

Captain David Baker, U.S.A., ordered to Fort Bliss upon the abandonment of Fort Niobrara.

Lieutenant C. G. Bartlett, ordered before the Presidio Promotion Board for examination, and from the Presidio of San Francisco to the camp of instruction at American Lake, Wash.

Captain James L. Bevans, U.S.A., promoted from Lieutenant June 29, 1906, and order for the camp at Mt. Gretna revoked.

Major Henry P. Birmingham, U.S.A., ordered to temporary charge of the Chief Surgeon's Office, Department of the Gulf, and to Chickamauga Park, Ga., and return.

Captain Horace D. Bloombergh, U.S.A., promoted from First Lieutenant, June 29, 1906.

Lieutenant John R. Bosley, U.S.A., ordered from Fort Egbert to Seattle.

Lieutenant Perry L. Boyer, U.S.A., ordered before the Washington Promotion Board for examination, and to accompany troops from Fort Sam Houston to Austin, Tex., and return.

Captain Thomas S. Bratton, U.S.A., appointed member of a Promotion Board at Manila.

Captain Louis Brechemin, Jr., U.S.A., promoted from First Lieutenant June 29, 1906, and ordered from the Presidio of San Francisco to the camp of instruction at American Lake, Wash.

Captain Roger Brooke, U.S.A., promoted from First Lieutenant, June 29, 1906.

Dr. Ira C. Brown, U.S.A., granted two months sick leave.

Dr. Wilmont E. Brown, U.S.A., granted three months leave.

Surgeon C. D. W. Brownell, U.S.N., ordered from the Providence Naval Recruiting Station to the Newport Naval Training Station, with additional duty on the *Constellation*.

Captain Charles Y. Brownlee, U.S.A., promoted from First Lieutenant, June 29, 1906, and ordered from the Presidio of San Francisco to the camp of instruction at American Lake, Wash.

General Joseph D. Bryant, U.S.A., formerly Surgeon General of New York, and long an Active Member of the Association of Military Surgeons, was elected President of the American Medical Association at its recent meeting in Boston.

Captain Carroll D. Buck, U.S.A., promoted from First Lieutenant, June 29, 1906.

Assistant Surgeon Heber Butts, U.S.N., appointed with the rank of Lieutenant (j.g.) June 1, 1906, and ordered to the Naval Academy.

Dr. George F. Campbell, U.S.A., sailed from San Francisco for the Philippines on the *Thomas*.

Lieutenant James Carroll, U.S.A., appointed delegate to the British Medical Association meeting at Toronto, Canada.

Lieutenant Robert S. Carswell, U.S.A., ordered from the Presidio of San Francisco to the camp of instruction at American Lake, Wash.

Major Edward C. Carter, U.S.A., ordered from Fort Leavenworth to the camp of instruction at Fort Riley.

Captain Walter C. Chidester, U.S.A., ordered to temporary duty as Attending Surgeon, Headquarters Department of California, and examiner of recruits in San Francisco.

Captain Walter Cox, U.S.A., granted two months leave, and ordered to accompany troops from Fort Reno to Fort Riley.

Lieutenant George H. Crabtree, U.S.A., ordered before the Ancon Promotion Board.

Dr. William O. Cutcliffe, U.S.A., granted three months leave in the United States.

Captain Wilson T. Davidson, U.S.A., ordered from the Presidio of San Francisco to the camp of instruction at American Lake, Wash.

Lieutenant William T. Davis, U.S.A., returned with Co. A Hospital Corps from temporary duty at San Francisco.

Dr. George W. Daywalt, U.S.A., ordered to Key West Barracks for temporary duty.

Captain Matthew A. DeLaney, U.S.A., promoted from First Lieutenant, June 29, 1906.

Captain John R. Devereux, U.S.A., promoted from First Lieutenant, June 29, 1906, and ordered from the Department of the Pacific to his proper station at Fort Logan.

Captain Wallace De Witt, U.S.A., promoted from First Lieutenant, June 29, 1906.

Acting Assistant Surgeon H. L. Dollard, U.S.N., ordered to the New York Naval Hospital.

Assistant Surgeon B. H. Dorsey, U.S.N., ordered from the *Hancock* to examination for promotion and then to wait orders.

Captain Basil H. Dutcher, U.S.A., ordered from Washington, D. C., to the Philippines, and left San Francisco on the *Sheridan* for Manila.

Lieutenant W. R. Eastman, U.S.A., ordered before the Presidio Promotion Board for examination.

Captain B. J. Edger, Jr., U.S.A., returned to Fort Sam Houston from Fort Brown, and ordered to accompany troops from Fort Sam Houston to Austin, Tex., and return.

Captain George M. Ekwurzel, U.S.A., promoted from First Lieutenant June 29, and ordered from Fort Keogh to the Presidio General Hospital, and thence to Fort Hamilton.

Assistant Surgeon C. F. Ely, U.S.N., ordered from the Marine Detachment at Panama home to wait orders.

Dr. Robert L. Felts, U.S.A., ordered to the camp of instruction at Austin, Tex., until relieved by another officer, when he will return and take three months leave.

Dr. James B. Ferguson, U.S.A., granted three months leave.

Captain Peter C. Field, U.S.A., promoted from First Lieutenant, June 29, 1906.

Captain Charles E. B. Flagg, U.S.A., ordered to accompany troops to the camp of instruction at American Lake, Wash.

Captain Clyde S. Ford, U.S.A., ordered from New York to Philadelphia on inspection duty.

Lieutenant Charles E. Freeman, U.S.A., ordered from La Grange, Mo., to the Philippines.

Passed Assistant Surgeon G. F. Freeman, U.S.N., ordered for special duty with the Surgeon General of the Navy.

Major Charles M. Gandy, U.S.A., detailed as Professor of Hygiene at the U.S. Military Academy

Assistant Surgeon P. E. Garrison, U.S.N., appointed with the rank of Lieutenant (j. g.) June 1, 1906, and ordered to the Philadelphia Naval Hospital.

Assistant Surgeon A. J. Geiger, U.S.N., ordered to the *Brooklyn*.

Captain Harry L. Gilchrist, U.S.A., returned with Co. A Hospital Corps from temporary duty at San Francisco.

Assistant Surgeon J. E. Gill, U.S.N., ordered from the *Kearsarge* home to wait orders.

Acting Assistant Surgeon F. L. Goddard, P.H.&M.H.S., granted one month's leave.

Captain George H. R. Gosman, U.S.A., promoted from First Lieutenant, June 29, 1906.

Lieutenant Colonel William W. Gray, U.S.A., granted one month's extension of sick leave.

Lieutenant J. W. Grissinger, U.S.A., ordered to Mt. Gretna for duty at the encampment.

Captain Robert B. Grubbs, U.S.A., promoted from First Lieutenant, June 29, 1906.

Surgeon M. S. Guest, U.S.N., ordered from the Newport Naval Training Station to the *Tennessee*.

Lieutenant James E. Hall, U.S.A., ordered before the Presidio Promotion Board for examination.

Captain Paul S. Halloran, U.S.A., promoted from First Lieutenant, June 29, 1906.

Lieutenant Louis H. Hanson, U.S.A., ordered from Eau Claire, Wis., to Fort Liscum, Alaska.

Dr. Herbert I. Harris, U.S.A., arrived at San Francisco on the *Sheridan* on leave from the Philippines, and granted one month's extension of leave.

Captain F. M. Hartsock, U.S.A., ordered from Fort Bliss to New York as Attending Surgeon and Medical Superintendent of the Army Transport Service.

Captain George P. Heard, U.S.A., promoted from First Lieutenant, June 29, 1906, and ordered from the Presidio General Hospital to Fort Wingate.

Dr. Oswald F. Henning, U.S.A., ordered from Chicago to Fort Sheridan,

Dr. John R. Hereford, U.S.A., ordered from Fort Moultrie to Fort Caswell for temporary duty.

Medical Director A. A. Hoehling, U.S.N., ordered from the Naval Medical Examining Board to his home.

Dr. David D. Hogan, U.S.A., ordered to Fort Hamilton, and from Fort Hamilton to Fort Jay for temporary duty and return.

Lieutenant Lucius L. Hopwood, U.S.A., ordered from Des Moines, Ia., to the Philippines.

Dr. Leonard S. Hughes, U.S.A., ordered to render necessary medical attendance at Fort Baker.

Lieutenant P. W. Huntington, U.S.A., ordered from the Presidio of San Francisco to the camp of instruction at American Lake, Wash.

Dr. T. Ogier Hutson, U.S.A., ordered from the Philippines to Fort McPherson.

Passed Assistant Surgeon J. H. Iden, U.S.N., ordered to duty with marines at Camp Elliott, Panama.

Lieutenant George W. Jean, U.S.A., ordered before the Manila Promotion Board for examination.

Dr. Ernest K. Johnstone, U.S.A., ordered from Chicago to San Francisco for duty in the Department of California, and to the Presidio of San Francisco.

Lieutenant Harold W. Jones, U.S.A., ordered from St. Louis to the camp in Sequoia National Park.

Captain Percy L. Jones, U.S.A., ordered from Fort Preble to accompany troops from Fort Ethan Allen to the camp of instruction at Mt. Gretna, Pa.

Major Frank R. Keefer, U.S.A., ordered from the Presidio of San Francisco to the camp of instruction at American Lake, Wash.

Passed Assistant Surgeon W. W. King, P.H.&M.H.S., ordered from special temporary duty at Missoula, Mont., to Washington, D.C.

Captain Thomas J. Kirkpatrick, U.S.A., ordered from Fort McPherson to duty at the U.S. Target Range, Waco, Ga.

Major William L. Kneedler, U.S.A., retired from active service on account of disability.

Captain Conrad E. Koerper, U.S.A., promoted from First Lieutenant June 29, 1906.

Dr. Fred T. Koyle, U.S.A., returned to Fort McDowell from temporary duty at Fort Mason.

Captain Lloyd LeR. Krebs, U.S.A., promoted from First Lieutenant, June 29, 1906.

Dr. Charles E. Kuhn, U.S.A., returned from San Francisco to Fort Lawton.

Assistant Surgeon A. E. Lee, U.S.N., ordered to the Mare Island Naval Hospital.

Dr. Robert Lemmon, U.S.A., ordered from Fort Warren to Fort McKinley.

Lieutenant Leon T. LeWald, U.S.A., ordered to accompany recruits from Fort Slocum to Fort Wright.

Lieutenant William L. Little, U.S.A., ordered to accompany troops from Fort Sam Houston to Austin, Tex., and return.

Lieutenant Albert G. Love, U.S.A., ordered from Memphis, Tenn., to the camp in Yosemite National Park.

Passed Assistant Surgeon L. L. Lumsden, P.H.&M.H.S., ordered from the U.S. Revenue Cutter Service Depot to the Washington Hygienic Laboratory.

Captain Theodore C. Lyster, U.S.A., appointed member of a Promotion Board at Ancon.

Captain William J. Lyster, U.S.A., ordered to accompany troops from Fort Sam Houston to Austin, Tex., and return.

Captain Patrick H. McAndrew, U.S.A., promoted from First Lieutenant, June, 29, 1906.

Acting Assistant Surgeon E. F. McConnell, P.H.&M.H.S., ordered to Banes, Cuba.

Dr. Thomas B. McCown, U.S.A., ordered to Fort Mott.

Passed Assistant Surgeon T. B. McClintic, P.H.&M.H.S., ordered to the revenue cutter *McCulloch* for special cruise in Alaskan waters.

Lieutenant Henry B. McIntyre, U.S.A., ordered from Randolph, Vt., to the Philippines.

Captain Charles E. Marrow, U.S.A., ordered from Fort Monroe to accompany troops from Fort Myer to the camp of instruction at Mt. Gretna, Pa.

Major Charles F. Mason, U.S.A., granted one month's leave.

Lieutenant R. W. Metcalfe, U.S.A., ordered before the Washington Promotion Board for examination, and from Columbus Barracks to Fort Lawton, Wash., with recruits.

Lieutenant Edgar W. Miller, U.S.A., ordered from Fort Clark to Fort Sam Houston for temporary duty.

Lieutenant R. B. Miller, U.S.A., ordered before the Washington Promotion Board for examination.

Dr. William G. Miller, U.S.A., ordered from the Philippines to San Francisco for orders.

Captain John A. Murtagh, U.S.A., promoted from First Lieutenant, June 29, 1906, and ordered from Fort Mason to accompany troops to the maneuvers in the Department of the Columbia.

Dr. William H. Myers, U.S.A., ordered from Lynn Grove, Ky., to Washington Barracks.

Surgeon F. S. Nash, U.S.N., ordered from the *Monadnock* to the Olongapo Naval Station.

Captain Kent Nelson, U.S.A., promoted from First Lieutenant, June 29, 1906, and ordered to accompany troops from Washington Barracks to Mt. Gretna for duty at the encampment.

Dr. Ralph W. Newton, U.S.A., granted two months leave, and ordered from San Francisco to Barre, Vt., for annulment of contract.

Lieutenant Henry J. Nichols, U.S.A., ordered from Binghamton, N.Y., to the Philippines.

Captain Robert E. Noble, U.S.A., promoted from First Lieutenant, June 29, 1906.

Captain Roderic P. O'Connor, U.S.A., promoted from First Lieutenant, June 29, 1906.

Captain Henry Page, U.S.A., ordered to return to Fort Clark.

Passed Assistant Surgeon E. G. Parker, U.S.N., ordered from the *Pensacola* to Washington for examination for promotion and thence home to wait orders.

Captain Robert U. Patterson, U.S.A., promoted from First Lieutenant, June 29, 1906.

Passed Assistant Surgeon L. H. Payne, Jr., U.S.N., ordered from the *Nashville* home to wait orders.

Assistant Surgeon T. N. Pease, U.S.N., ordered to examination for promotion and thence to the *Hancock*.

Captain James M. Phalen, U.S.A., ordered to accompany troops from Fort Clark to the camp of instruction at Austin, Texas, and granted four and one-half months leave.

Captain Henry du R. Phelan, late Assistant Surgeon of U.S. Volunteers, who suffered so severely during the recent San Francisco earthquake disaster, has been appointed Contract Surgeon U.S. Army, and ordered to Fort Rosecrans for temporary duty.

Surgeon G. Pickrell, U.S.N., detached from the *Franklin* and granted three months leave.

Lieutenant Omar W. Pinkston, U.S.A., ordered from Kansas City to Fort Leavenworth Military Prison for temporary duty.

Acting Assistant Surgeon G. R. Plummer, U.S.N., reappointed for three years from July 1.

Dr. William H. Pomeroy, U.S.A., granted one month's leave.

Surgeon James C. Pryor, U.S.N., was married at Washington, D. C., June 16, 1906, to Miss Georgia Leontine Mackay.

Major William R. Purviance, U.S.A., appointed member of a Promotion Board at Manila.

Lieutenant W. L. Pyles, U.S.A., ordered to accompany recruits from Jefferson Barracks to Fort Wright.

Lieutenant Charles A. Ragan, U.S.A., ordered before the Washington Promotion Board for examination.

Assistant Surgeon T. W. Raison, U.S.N., appointed with the rank of Lieutenant (j.g.) June 1, 1906, and ordered to the Norfolk Naval Hospital.

Captain Irving W. Rand, U.S.A., ordered from the Presidio of San Francisco to the camp of instruction at American Lake, Wash.

Major Thomas U. Raymond, U.S.A., appointed member of a Promotion Board at Manila.

Lieutenant Matthew A. Reasoner, U.S.A., ordered from Morrisonville, Ill., to the Philippines.

Assistant Surgeon W. E. Rennie, U.S.N., ordered to the *Lancaster*.

Captain William W. Reno, U.S.A., promoted from First Lieutenant, June 29, 1906.

Lieutenant Edwin W. Rich, U.S.A., ordered before the Washington Promotion Board for examination.

Dr. George H. Richardson, U.S.A., ordered to temporary duty as Surgeon of the transport *Buford*.

Assistant Surgeon Norman Roberts, P.H. & M.H.S., ordered from Fort Stanton, N.M., to the Washington Hygienic Laboratory.

Captain William Roberts, U.S.A., retired for disability, July 15, 1906.

Captain Edward P. Rockhill, U.S.A., ordered from Fort Wingate to the Philippines.

Assistant Surgeon P. S. Rossiter, U.S.N., ordered to the Naval Academy.

Surgeon W. H. Rucker, U.S.N., ordered from the Naval Medical School to the Providence Naval Recruiting Station.

Captain E. L. Ruffner, U.S.A., granted two months extension of leave.

Captain Fredk. S. Russell, U.S.A., ordered from the Presidio of San Francisco to the camp of instruction at American Lake, Wash.

Assistant Surgeon C. E. Ryder, U.S.N., ordered to the Boston Navy Yard.

Dr. Joseph L. Sanford, U.S.A., granted two months leave in the United States.

Surgeon H. W. Sawtelle, P.H. & M.H.S., granted two months sick leave.

Lieutenant Ferdinand Schmitter, U.S.A., ordered from Schenectady, N. Y., to Fort Egbert, Alaska.

Lieutenant George H. Scott, U.S.A., granted one month's extension of leave.

Captain Herbert G. Shaw, U.S.A., promoted from First Lieutenant, June 29, 1906, and ordered to the Presidio General Hospital.

Dr. James E. Shellenberger, U.S.A., upon the abandonment of Fort Ringgold ordered to Fort Brown, and to accompany troops from Fort Sam Houston to Austin, Tex., and return.

Passed Assistant Surgeon H. O. Shiffert, U.S.N., ordered from the Philadelphia Naval Hospital to the Marine Detachment on the Isthmus of Panama.

Captain Ira A. Shimer, U.S.A., granted six weeks leave.

Captain J. R. Shook, U.S.A., ordered from Fort Des Moines to the camp of instruction at Fort Riley.

Captain Edmund D. Shortlidge, U.S.A., promoted from First Lieutenant, June 29, 1906.

Dr. Ernest F. Slater, U.S.A., ordered from Fort Hamilton to Fort Adams for temporary duty.

Lientenant Robert Smart, U.S.A., ordered from Fort Myer to Camp Chickamauga Park.

Lieutenant William M. Smart, U.S.A., ordered from Fort Caswell to Camp Chicakmauga Park for temporary duty.

Acting Assistant Surgeon H. L. Smith, U.S.N., appointed to date from July 5, 1906.

Lieutenant H. M. Smith, U.S.A., ordered before the Presidio Promotion Board for examination.

Dr. Rodney D. Smith, U.S.A., granted two months leave and ordered from Fort Columbia to the Philippines.

Assistant Surgeon W. B. Smith, U.S.N., ordered from the *Hancock* to examination for promotion and then to wait orders.

Acting Assistant Surgeon W. G. Steadman, Jr., U.S.N., ordered to the New York Naval Hospital.

Lieutenant Chester J. Stedman, U.S.A., ordered from Fort Liscum to Seattle.

Stabsarzt Dr. Johann Steiner of the Austro-Hungarian War Ministry has been honored with the cross of Donatus (Donatkreuz) of the first class, by the Sovereign Order of Malta, and the cross of Marianus (Marinerkreuz) by the Teutonic Order.

General George M. Sternberg, U.S.A., is President of the Washington Sanatorium Company, organized for the purpose of providing facilities for the open air treatment of tuberculosis in the city of Washington and its vicinity.

Assistant Surgeon A. M. Stimson, P.H.&M.H.S., ordered to Ellis Island, and from Ellis Island to the Washington Hygienic Laboratory for temporary duty.

Passed Assistant Surgeon G. M. Stimpson, P.H.&M.H.S., promoted Surgeon from February 10, 1906.

Captain Verge E. Sweazey, U.S.A., promoted from First Lieutenant, June 29, 1906.

Captain Robert M. Thornburgh, U.S.A., promoted from First Lieutenant, June 29, 1906.

Dr. George B. Tattle, U.S.A., ordered from the Department of California to Fort Columbia.

Surgeon General Dr. Josef Ritter von Uriel of the Austro-Hungarian service has been promoted to the rank of Lieutenant General (Feldmarschal-leutenant) with the title of General-Oberstabsarzt. He represents the Austro-Hungarian government at the Geneva Convention.

Captain Francis M. C. Usher, U.S.A., ordered to the camp of instruction at Fort Benjamin Harrison.

Captain James W. Van Dusen, U.S.A., promoted from First Lieutenant, June 29, 1906.

Captain Gideon McD. Van Poole, U.S.A., promoted from First Lieutenant, June 29, 1906.

Major William J. Wakeman, U.S.A., ordered from Fort Thomas to accompany troops to the camp of instruction at Fort Benjamin Harrison.

Major Philip G. Wales, U.S.A., granted four months leave upon arrival in the United States.

Assistant Surgeon R. A. Warner, U.S.N., ordered from the Naval Academy to the *Louisiana*.

Dr. Clarence A. Warwick, U.S.A., ordered from Fort Mott to his home, Keokuk, Ia., for annulment of contract and granted one month's leave.

Dr. Victor E. Watkins, U.S.A., ordered from Fort Mansfield to Plattsburgh Barracks.

Captain Henry A. Webber, U.S.A., ordered from Fort Banks to accompany troops from Plattsburgh Barracks to the camp of instruction at Mt. Gretna, Pa.

Assistant Surgeon L. H. Wheeler, U.S.N., ordered from the Cavite Naval Station to the *Helena*.

Dr. Jean C. Whinnery, U.S.A., ordered from Boise Barracks to Fort Casey.

Captain Clement C. Whitcomb, U.S.A., promoted from First Lieutenant, June 29, 1906, and ordered from Fort McKinley to accompany troops from Fort Ethan Allen to the encampment at Mt. Gretna, Pa.

Captain Eugene R. Whitmore, U.S.A., promoted from First Lieutenant, June 29, 1906, and ordered from Fort Jay to the encampment at Mt. Gretna, Pa.

Captain William H. Wilson, U.S.A., ordered from duty as Attending Surgeon and Medical Superintendent of the Army Transport Service in New York to Fort Hamilton.

Acting Assistant Surgeon A. H. Wise, U.S.N., ordered home from the Washington Navy Yard and granted leave until expiration of appointment.

Captain William P. Woodall, U.S.A., promoted from First Lieutenant, June 29, 1906.

Captain Frank T. Woodbury, U.S.A., left San Francisco on the *Sheridan* for Manila.

Major Charles E. Woodruff, U.S.A., ordered from Plattsburgh Barracks to the encampment at Mt. Gretna with stop en route at Governor's Island, to consult with the Chief Surgeon Department of the East.

Assistant Surgeon E. L. Woods, U.S.N., ordered from the Naval Academy to the *Kearsarge*.

Major Robert S. Woodson, U.S.A., ordered from the Presidio of San Francisco to the camp of instruction at American Lake, Wash.

Assistant Surgeon J. S. Woodward, U.S.N., ordered from special duty in the Bureau of Equipment home to wait orders.

Passed Assistant Surgeon G. B. Young, P.H.&M.H.S., promoted to Surgeon with rank from December 10, 1905.

A ROYAL SURGEON GENERAL.—The appointment of Prince Louis Ferdinand of Bavaria to the office of Surgeon General of the Spanish Army is a significant indication of the growing importance of the medical department, this being the first case of the appointment of a prince of the blood to a military medical office.

MAINE MILITIA MEDICAL DEPARTMENT.—A Medical Corps of the Maine Volunteer Militia was organized by a General Order issued on June 7, to consist of one Surgeon General (Colonel), two Surgeons (Major), two Assistant Surgeons (Captain), two Assistant Surgeons (Lieutenant), and one Assistant Surgeon (Lieutenant j. g.). Medical officers are to be nominated by regimental commanders, but will be required to pass a strict medical and surgical examination before being commissioned. The former medical officers have been appointed to the new Corps.

PUBLIC HEALTH AND MARINE HOSPITAL SERVICE.—There are a number of vacancies in the Public Health and Marine Hospital Service and examinations will be held for the purpose of filling them at the Bureau, in Washington, on Monday, August 6. The examination will follow the usual course, covering physical, oral, written and clinical subjects. The pay is the same as in the Army Medical Service, with the usual longevity pay. Successful candidates will be commissioned in order of merit, as determined by the examination. Further information and invitations to appear before the Board for examination may be obtained from the Surgeon General, Public Health and Marine Hospital Service, Washington, D. C.

PRELIMINARY EXAMINATIONS FOR THE ARMY MEDICAL CORPS.—Medical officers have been detailed to conduct the preliminary examination for admission to the Army Medical Corps on July 31, 1906, at the following points: General Hospital, Washington Barracks,—Captain Deane C. Howard and Captain Conrad E. Koerper; Fort Sheridan,—Major Alfred E. Bradley;

Fort Jay,—Major Charles Richard and Captain Frederick M. Hartsock; Fort Thomas,—Lieutenant Levy M. Hathaway; Fort Snelling,—Major Euclid B. Frick; Fort Niagara,—Captain Willard F. Truby; Jefferson Barracks,—Major William B. Banister and Lieutenant William A. Powell; Fort Leavenworth,—Captain Carroll D. Buck; Columbus Barracks,—Lieutenant Raymond F. Metcalfe and Lieutenant Nelson Gapen; Fort Des Moines,—Major George D. Deshon and Captain Jay Ralph Shook; Army and Navy General Hospital, Hot Springs, Ark.,—Lieutenant Colonel Blair D. Taylor, Lieutenant Charles A. Ragan and Lieutenant Jacob M. Coffin; Madison Barracks,—Major Harry M. Hallock; Fort Adams,—Major Robert J. Gibson; Austin, Texas,—Major Henry D. Snyder, Captain Benjamin J. Edger, Jr., and Captain William J. L. Lyster; Vancouver Barracks,—Major William D. Crosby; Fort Oglethorpe,—Captain James S. Wilson, Lieutenant William T. Davis and Lieutenant John A. Clark; General Hospital, Fort Bayard,—Major George E. Bushnell, Major Edward L. Munson and Captain Roger Brooke, Jr.; Fort Worden,—Captain Samuel M. Waterhouse.

THE ARMY MEDICAL REORGANIZATION BILL.—With the medical profession as a unit behind it, the Army Medical Reorganization Bill has again failed to come to a vote in the House, although favorably reported by the House Military Committee. The Speaker was urged in person, by letter and by telegraph, from all directions, to permit the bill to come to a vote, but failed to do so. He, however, promised to allow it to come up in the forthcoming session, and if this is done, it will undoubtedly become a law in some form. Among the telegrams sent him were messages from the American Medical Association and the American Medical Editors' Association, the latter of which was based upon the following resolution:

"Resolved: That the American Medical Editors' Association telegraph to the Speaker of the House of Representatives that only the passage of the Bill to reorganize the Medical Department of the Army can save this country from disgrace in the eyes of the world and avoid a mortality in peace and war which shall put the entire nation to shame and that as citizens and representatives of the medical press of the United States we urge that the Bill in question be brought to passage and that without delay."

Congress and the Speaker should be impressed with the fact—self evident to every physician—that this Bill is the most important health measure brought before Congress in many years, and that in the event of hostilities, they must alone bear the blame for the dire results that will be sure to ensue from failure to enact it. It is not believed that our representatives would be willing to be placed in this position if fully informed of the consequences of it, and it is strongly urged that the profession throughout the country bring, in every possible way, pressure, which may result in full information upon the subject, so that the successful enactment of the Bill may occur early in the coming session.

Current Literature.

LETTERS FROM A SURGEON OF THE CIVIL WAR.*

THIS interesting little book consists of a series of letters written by Dr. John G. Perry, who while still a medical student entered the Army medical service in 1862, and with a brief interim, during which he took his degree, and was commissioned as Assistant Surgeon of the 20th Massachusetts Volunteers, served until nearly the end of the Rebellion. These letters have been lying among the family treasures until the present day when they have been collected and edited, and are now placed at the service of the public. They form a highly picturesque and illustrative series of pictures of the medical service during the Civil War and pertain to the best type of history.

FOWLER'S SURGERY.†

THE second volume of the posthumous treatise on Surgery, of the late General Fowler, fully sustains the high standard erected in the first. This volume continues the subject of regional surgery in five divisions: (1) Surgery of the Dorsal and Lumbar Vertabrae; (2) Surgery of the Abdominal and Pelvic Regions; (3) Surgery of the Female Pelvic Organs; (4) Surgery of the Upper Extremity; (5) Surgery of the Lower Extremity. As would be expected, the Surgery of the Abdominal and Pelvic Regions occupies more than half of the volume, the subject being treated in great detail, but with exceeding clearness and definiteness. The illustrations are particularly

**Letters from a Surgeon of the Civil War.* By JOHN G. PERRY, M.D. Compiled and edited by MARTHA DERBY PERRY. 8vo; pp. 225, with eight illustrations. Boston, Little, Brown & Co., 1906.

†*A Treatise on Surgery.* By General GEORGE RYERSON FOWLER, N.G. N.Y. Vol. II. Imp. 8vo; pp. 714, with many illustrations. Philadelphia and London, W. B. Saunders Co., 1906.

good, all being original and evidently drawn from actual clinical exposés. While the author has not hesitated to refer freely to the work of others, as is shown by an extensive index of authorities at the end of the volume, the book is essentially a presentation of his own practice as developed by the many years of surgical work in which he had been engaged.

BUTLER'S MATERIA MEDICA.*

THE wide popularity of this work is attested by the appearance of a fifth edition within a decade. This edition has been entirely remodeled, rewritten and reset, bringing it into accord with the new Pharmacopeia. All obsolete matter has been excluded and much recent information has been added, bringing it fully up to the present time.

YEAR BOOK OF GENERAL MEDICINE.†

THE General Medicine volume of the Year Book Series for 1906 forms a most valuable summary of the year's work, as would be expected from the reputation of its authors, Drs. Frank Billings and J. H. Salisbury of Chicago. The book is in a convenient size for handling and well arranged for reference.

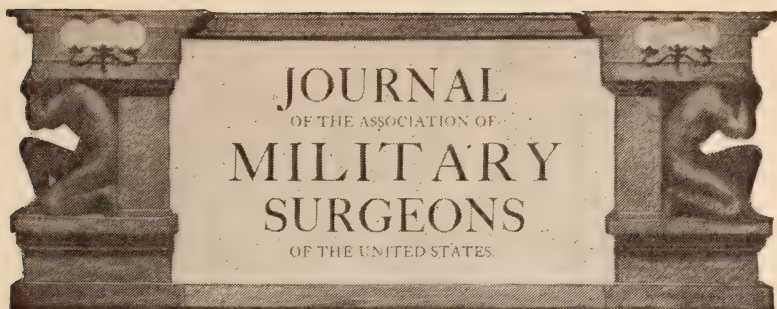
POLK'S MEDICAL DIRECTORY.‡

THE new medical directory of North America, which has so long and so successfully been conducted by Messrs. R. L. Polk & Co., fully sustains its high reputation for accuracy and comprehensiveness. Its many valuable features are too well known to require special mention, and the 1906 edition will undoubtedly receive wide acceptance upon the part of the profession.

*A Textbook of *Materia Medica, Therapeutics, and Pharmacology*. By GEORGE F. BUTLER, M.D. Fifth Edition, Revised by SMITH ELY JELLIFFE, M.D. 8vo; pp. 694. Philadelphia and London, W. B. Saunders Co., 1906.

†General Medicine. By FRANK BILLINGS, M.D. and J. H. SALISBURY, M.D. Vol. I of the Practical Medicine Series, 1906. 12mo; pp. 369. Chicago, The Year Book Publishers, 1906.

‡Polk's Medical Register and Directory of North America. 8vo; pp. 3166. R. L. Polk & Co., Detroit, Mich., 1906.



Original Memoirs.

ON THE IMPORTANCE OF THE PREVENTION OF INFECTIOUS DISEASES IN THE NAVY WITH A SUGGESTION AS TO THE PROPHYLACTIC TREATMENT OF SOME OF THE ACUTE EXANTHEMATA.

By HENRY GUSTAV BEYER, M.D.,
MEDICAL INSPECTOR IN THE UNITED STATES NAVY.



THE prevention of infectious diseases, likely to assume the epidemic form, on board ship, is one of the most difficult problems before the medical profession of the Navy at the present time. This problem appears to be of an importance so great that every medical officer of the Navy, whether he has specialized as a surgeon or as a physician, would indeed do well never to allow himself for one moment to forget, while treating individual cases on ship-board, that the chief duty to his command lies in the prevention of the ever-present danger from infectious disease threatening the ship's company as a whole.

This problem has grown in magnitude *pari passu* with the growth of the navy itself; it has grown directly proportional to the number and the size of our ships; to the number of the enlisted personnel in the service; to the number and size of the complement of men necessary to properly man a modern first-class cruiser or battleship and to the increased and still increasing necessity and importance of their preparedness for war.

With regard to the necessity and importance of preparedness, we may quote with advantage what Mr. H. W. Wilson¹ has recently said on that subject: "Success has been proven to depend on three things: Being ready first, the possession of a personnel trained for war and not merely practised in inane peace evolutions, and a good materiel. Pushing the analysis a point further, it is clear that the personnel is the final determinant of victory the best ships will be useless weapons if the men who have to work and fight them are unready or ill trained when the day of battle comes." From this quotation, it may easily be seen that Mr. Wilson lays special stress on readiness and perhaps still greater weight is laid by him on the training of the personnel; in other words the point of gravity of the whole situation rests not on the ships nor on the guns, nor yet on the men behind the guns, but on the *training* of the men in the use of their instruments.

Quite in keeping with these sentiments expressed by the English naval expert are the opinions advanced by Mr. A. S. Hurd²: "Navies should not be compared by counting noses; deeper and truer comparisons are founded upon the measure of efficiency in all drills and exercises attained by rival navies and upon the brain power of those who control them it is in war training that victory lies. With a smaller naval force than the least of British fighting fleets, Japan has completely annihilated the first Pacific squadron of Russia. The victory has not been due to more numerous or better ships, to superior guns or to more powerful torpedoes, but to the simple fact that the Japanese had studied their instruments. Month after month they were manoeuvring and drilling and the result was the creation of a wonderful degree of homogeneity, that oneness between ships

and men, that knowledge of the capabilities of the engines placed in their control which spells naval power.”

In view of the fundamental importance of training and of the necessity of its being steady and progressive, it is clear that anything tending to interrupt or even retard that process must be as much as possible eliminated no matter at what price. Since it can not be denied but must be freely admitted by all that the physical condition of the personnel of a ship and its steady and progressive development towards ideal perfection is one of the fundamental conditions and aims of naval training³ it must be equally admitted as a simple and quite significant truth that disease, especially when assuming the epidemic form on board ship, will very seriously hamper if not altogether interrupt for the time being the progress towards that ideal and, consequently perhaps forever impair the future as well as present degree of efficiency of a ship as a fighting unit in the fleet. The influence of epidemics is the same on professional training. Consequently, as may be seen, the relation between epidemic disease and the ultimate object of naval training is an important one and should be kept in mind. As an integral part in the living machinery of a man-of-war contributing to power and efficiency, the medical officer may sometimes find himself in a position to play no unimportant part, if he sees and performs his duty. But this duty is difficult and must be done well. The stigma of neglect that would attach either to the individual or to the corps in a matter of duty of as far reaching importance to the service as this is, would be serious indeed. It will, therefore, be well for us to find out from time to time how we stand with regard to this problem.

According to the report of the Surgeon General to the Secretary of the Navy for 1904, there were recorded 3,758 admissions for infectious diseases (Class II) in the force afloat and 2,274 in the force employed in navy-yards and other shore stations, during the year 1903. The total number of all admissions for the year 1903 in the force afloat, for disease alone and, after deducting that included under the four classes XII-XVI, is 17,124. The percentage of admissions of infectious to other diseases is,

therefore, for the force afloat, twenty-two in round numbers. The number of days consumed by these 3,758 admissions for infectious diseases is 20,846. The total number of sick days for all diseases during the same period and after deducting those for the four classes not included in this calculation, is 114,759. Per cent of sick days of infectious to other diseases: 18.1. For the force afloat, our calculation would show that 22 per cent of all admissions for disease were due to infectious diseases, giving 18.1 per cent of all the sick days for the year. Making the same calculations for the force employed in the navy yards and other shore stations we obtain the following figures: Percentage number of admissions for infectious to other diseases, 36; of sick days, 31.

The average strength of the navy and marine corps for the year 1903 was recorded as 37,248 and that shown by the reports of the Medical Department was 36,535. Deducting from the last number the total number of the force afloat, or 27,556, we get 8,979 as representing the number of the enlisted personnel employed on shore stations. Or, expressed in percentages, we have 75.4 per cent of the entire enlisted personnel in the navy serving afloat and 24.6 per cent serving on the various shore stations. Carrying our calculation a point further and computing the percentage number of admissions to the relative strength of the forces afloat and ashore respectively, we obtain 13.6 per cent for the former and 25.3 per cent for the latter. In other words, we have just about twice the number of admissions for infectious diseases on shore that we have afloat.

From the results of these few simple calculations, we may derive some very substantial and valuable points of information. First, as regards the relative frequency of the occurrence of infectious diseases between ship and shore, we find a proportion of twenty-two to thirty-six per cent in favor of the shore stations of the admissions and a proportion of eighteen to thirty-one per cent of the time consumed, likewise, in favor of the shore stations. Since hospital cases were not included in the above figures and, since cases of infectious diseases are more liable to be promptly transferred to hospitals from shore stations than from sea-going

ships, the difference between ship and shore for both admissions and sick-days must, in reality, be much greater than is shown by our figures. Second with reference to the numerical relation between the admission and the present strength we find it to be just twice as great on shore as it is afloat. This significant fact, in view of the very much greater density of population existing on ship-board than on the shore stations, as well as in view of the almost explosive character of the spread of infectious diseases on board a ship, owing to the conditions of over-crowding¹ that exists on board every vessel as compared to those on shore, seems to admit of but one principal interpretation, namely: the better sanitary control that is exercised on board ship as compared to that on shore stations. This better sanitary control I venture to attribute to the fact that commanding officers of vessels are in more frequent consultations with and receive more often the advice and the recommendations of the medical officers under their command than do those in command of shore stations. This is one of the most striking illustrations showing the good results of *team work*, to borrow an athletic expression, on ship-board.

While it must be frankly admitted that it is much easier to carry infection into any one of our shore stations than it is on board of a ship in commission, this is more than offset by the conditions of overcrowding aiding its spread after infection has once been introduced. "The dissemination of the infection is in inverse ratio to the distance between individuals congregated together in a habitation; the greater the distance the less, and the less the distance the greater the liability for the infection to spread" (*Abbott*). Indeed, this difference almost entirely vanishes when we compare the number of days which a modern ship actually spends at sea with that which it spends in navy yards and, where communication between ship and shore is almost unrestricted.

The fact that interests us in this connection remains and this brief survey of the conditions as they exist in the navy today has amply shown it, namely: that there is as yet much good work for medical officers to accomplish. The large number of

admissions for infectious diseases must and can be considerably reduced and, since the comparatively smaller number of cases occurring on ship-board has been traced to the influence of the medical department, it would seem to be through that department, through which its accomplishment must be effected. It would certainly be of great interest in this connection if similar conditions could be found in foreign navies for comparison. But, owing to the difference (1) in the classification of disease in general as well as (2) in the difference in the statistical methods of recording the results, the tables found in the sanitary reports of the British and German navies are not directly comparable with those found in the sanitary reports of the navy of the United States. The ratios of admission per 1,000 of strength, given in the last report of the German navy, are, for the forces afloat, 424.4 and for the land forces, 697.6. The corresponding ratios, according to calculations made, from the figures obtained in the last report of the Surgeon General of the U.S. Navy are, for the forces afloat, 739.1 and for those on shore, 788.4. With regard to the total number of admissions per 1,000 of strength, the United States navy with 751.2 per cent stands about midway between the British with 853.8 per cent and the German navy with 603.3—all observations recorded about the same year. A ratio of 603.3 per thousand, so the report states, is the lowest ratio ever attained in the German navy.

Our present knowledge of immunity and of its artificial production through the agency of certain immune sera does not seem to suffice for the much desired practical solution of our difficulties. Our knowledge of immune bodies and complements, of alexins, bacteriolysins, haemolysins, agglutinins and praecipitins, most interesting and valuable by-products though they be of our reséarches into the fundamental laws of the biology of cell life and, while having broadened our conceptions of the pathology of disease processes, has, so far at least, added little of practical importance and usefulness to our problem.

An impassable barrier seems to block the way to our goal and prevent us from attaining what many of us imagined was well within our reach and almost in sight, shortly after the new bac-

terial era had begun. But with the exception of the vaccine virus against smallpox, the discovery of which had nothing to do with modern bacteriology, we are in the possession of no specific means of fortifying the human organism against the invasion of its hereditary foes, the bacteria, which continue producing disease very much as they did of old. In spite of the most earnest and painstaking efforts of the most advanced scientific investigators in this field today, we have as yet discovered no similar vaccine for other diseases.

In view of the hopelessness of finding in the near future vaccines for the artificial immunization against the different bacterial diseases, it certainly is refreshing to read what Professor A. C. Abbott⁵ says in the closing remarks of the introduction to his work on the Hygiene of Transmissible Diseases. He says: "We consider it quite within the bounds of moderation and discretion to declare that, by the indefatigable practice of the sanitary precepts now known to be sound with regard to the prophylaxis and management of the common infectious diseases . . . to diet and clothing, the death rate from preventable causes would be conspicuously reduced and this, too, without the addition of a single new fact to the knowledge that we already possess." The leading principles and management of infectious diseases, known to us at present are three: (1) Increase the resistance of the human organism. By attention to exercise, diet, clothing, cleanliness and wholesome environment, we are able to increase the normal functional capacity of the physiological defences resident in every living organism and thus increase its resistance to the invasion of pathogenic germs. We know also from experience that intemperate habits in eating as well as drinking, exposure to excessive heat or cold, lack or excess of exercise, overcrowding, insufficient or foul air and general uncleanliness, all conditions lurking in the by-paths of a sailor's life, tend to lower that resistance. (2) Prevent the infectious germs from gaining an entrance into the human body which simply means that we must catch the invisible spark before it drops into the powder magazine. (3) Disinfection or the destruction of the infectious agents by all suitable means whether found without or within their natural hosts.

As properly belonging under the third head in the above classification and, with especial reference to the acute exanthemata, I believe that the treatment recommended by me several years ago⁶ is deserving of a more extended trial than it has received so far. I am encouraged in this belief, first, because of the uncommonly favorable results obtained by me during several epidemics on board the U.S.S. *Prairie* in 1901-1902, and, second, from the favorable notices the published account has since received in several European journals⁷. Although my experience with the treatment is limited to measles, I would, without hesitation and under suitable modifications, apply it to variola, varioloid, varicella, scarlatina, rubeola and febris exanthematicus, whenever opportunity offered.

TREATMENT.—An early diagnosis must, of course, always be aimed at, because the contagion is known to spread from patients affected with the disease, from two to three days or more before the characteristic eruption appears. The disease once diagnosed as measles, the patient is treated as follows: A clean white sheet is spread upon the deck of the sick bay and upon this the patient steps and leaves all his clothes, including shoes. All the clothes excepting the shoes are wrapped up in the sheet and put aside for steam sterilization, the shoes being separately disinfected with solution of bichloride of mercury. The patient receives, first, a thorough scrubbing with warm water, soap and a sterilized brush, going over every square inch of his surface, after which he is sponged over with a solution of bichloride (1:2,000), enveloped in a clean sheet moistened with the same solution, put to bed and covered with blankets. The bichloride bath is repeated three times daily during the period the eruption is at its height, twice daily during the remaining period. His mouth, throat and nose are cleaned by gargling and douching daily with normal salt solution to which once daily a minute quantity of some antiseptic is added, either carbolic acid or bichloride (1:20,000). He is kept constantly supplied with a large gauze handkerchief, soaked in bichloride solution to receive any expectorated matters or nasal discharges; he is directed to hold the handkerchief in front of his mouth and nose, while coughing

or sneezing, to catch the spray. Urine and bowel discharges are disinfected and thrown overboard after standing the required time, the vessels—cleaned, disinfected and dried,—kept ready for use. Any conjunctivitis, beginning otitis, tonsillitis, pharyngitis or bronchitis is at once taken in hand and treated antiseptically, and while the patient is still lying in bed. To this latter precaution, it is considered due that, whenever our patients were well with the measles, no complications nor sequelae remained and they were ready for duty almost the moment they were able to leave their beds.

In the meantime, immediately after a patient had been admitted to the list, the clothes he had worn and the contents of his bag as well as his mattress and hammock were exposed to running steam for two hours. His boots and shoes, since leather dries up brittle after exposure to steam, were simply sponged or washed out with a strong solution of bichloride (1:1,000) and allowed to dry in the open air. The average number of days between admission to the list and discharge to duty, was 8.58 days, the best results by far, ever attained in the navy.

All the patients were treated in the sick bay of the *Prairie* and it may be of interest to note in this place, without any precautions being taken as regards the possibility of their transmitting the disease to other patients lying right next to them; nor were any other precautions taken by the attendant than that they were warned to wash their hands and face before sitting down and taking their meals and yet, we can positively assert that in not a single instance was the disease communicated from any of the patients in the sick bay to any one, after they had once been placed under the treatment here described.

It will easily be seen that the principle of this treatment lies in the endeavor to let no living germ get away from the infected body. The patient is practically wrapped up in an antiseptic dressing, through which no germ can get alive. The mucous surfaces are kept moist, if not absolutely sterile, so that the contagion can not leave them, except perhaps during the involuntary efforts at sneezing and during coughing, when it is caught in the bichloride handkerchief. It is in this manner alone that we can

speak of isolation on board a crowded ship of 720 men as the *Prairie* was.

The bulk of the observations included in this report, was made in the year 1902, while the writer was attached to the U.S.S. *Prairie*. I mention the time, because the following year, an article appeared in the *Zeitschrift f. Hygiene*, by Dr. Jaroslav Elgart⁸ on the same subject, namely,—the prevention of the transmission of the contagium of some of the acute exanthemata to the healthy. The conditions under which Elgart made his observations were, however, somewhat different from those under which my observations were made. Elgart found himself in charge of a large hospital for children who, while being treated for other diseases, became frequently attacked by measles and scarlatina after being placed in the hospital, and many of them actually died of these diseases. The infectious agents being abroad and at large in the hospital, it became necessary to find some means of protecting these children from the infection, while they were undergoing treatment for their ailments, other than merely ventilation.

Elgart bases his treatment on the supposed existence of a primary lesion of the acute exanthemata somewhere on the mucous membranes of the mouth and respiratory tract. It would seem to me that this supposition has some foundation in the characteristic appearances, described in the several diseases of this group, of the mouth as, for instance, Koplik's spots in measles and the so-called protopustule in variola, the strawberry tongue, etc. Elgart assumes that the contagium of the eruptive fevers at first settles down in some places along the respiratory tract, forming a local lesion and perhaps multiplying; then it or its products enter the blood current and produce the symptoms of a constitutional intoxication. He, accordingly disinfects the normal mucous surfaces of the healthy with the object of producing either an inhibitory or a sterilizing effect. To this end he employs spraying with mild antiseptic solutions such as limewater, diluted with equal parts of water, 3 per cent solution of boric acid, a 0.05 per cent solution of iodium trichloratum or a 3 per cent solution of sodium chlorate. With these solutions he sprays

all his little patients twice daily while in the hospital and this treatment has been remarkably successful in preventing the recurrence of epidemics formerly the rule and very prevalent. The recorded results of this treatment are showing the good effects of the latter so invariably, that we must believe him to be properly justified in concluding, that in the inhalation of mild disinfectants, we possess an efficient means for protecting the healthy from infections entering the body through the respiratory tract.

Elgart's observations, continued for several years, would, at the same time, make it eminently probable that the principal part of entry into the body of the contagium in the acute exanthemata, is the respiratory tract, including perhaps the mouth. He, moreover, goes a step further in expressing his belief that, by spraying with disinfectants, we can favorably influence the course of the disease after it has fully declared itself. In accordance with this conception we would, in the acute exanthemata, have a similar condition of things to what we have in diphtheria, namely: a local lesion followed by a constitutional intoxication, only that these local lesions in the former are much less apparent and localized than they are in the latter.

It was certainly interesting to me to find the similarity as to principles of treatment pursued in both methods of treatment and in spite of the apparent difference in the conditions and objects of it. While Elgart's object was the prevention of the entry of the contagium from an uncertain environment into the well, mine was the prevention of the escape of the contagium from the infected sick while making for the well. In both methods alike disinfectants play the important role, being applied on similar principles to the same places, if not exactly in the same manner. With regard to the effects of bichloride on the skin in smallpox, a note of a case made by W. T. Councilman⁹ may be of interest in this connection: "A young man of twenty in the period of incubation and one day before the onset was operated on in the City Hospital for bilateral hammer toe and both feet and ankles put in a corrosive dressing. The eruption was abundant and took the usual course. The dressing was not removed until the fourth day of the eruption, when the skin beneath it was found normal."

To conclude, the two methods of treatment described in the foregoing pages are certainly suggestive and would seem to complement one another. One thing seems clearly shown, namely, the great advantage of the judicious use of disinfectants in the prophylactic treatment of the acute exanthemata.

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THE TREATMENT OF SWEATING FEET IN THE ARMY.

THE feet, says Assistant Surgeon E. Boecker (*Militarlaegen*), are washed in hot soap suds and are bathed with spirits. For ten or fifteen minutes a gauze compress, moistened with a four per cent solution of formalin is applied, after which the feet are air dried, sprinkled with a salicylate powder, and clean stockings applied. The boots are also disinfected with a ten per cent formalin solution. Recurrence after this treatment is rare, nursing for from three to four days producing a permanent cure.—HANS DAAE.

THE TREATMENT OF GONORRHOEA BY IRRIGATION.

By WILLIAM GREY MILLER, M.D.,

CONTRACT SURGEON IN THE UNITED STATES ARMY; FORMERLY
CAPTAIN AND ASSISTANT SURGEON IN THE UNITED
STATES VOLUNTEERS.

THE surgeons of the armed forces of the United States, both those in active service (the permanent military establishment) and the reserve forces (the state troops), take pride in the fine physique of the enlisted men who compose these bodies who are selected by the medical officers after careful examination as to their mental and physical qualifications; the majority of these men are under thirty-five years of age.

This condition of perfect health which is so essential in the make up of the ideal soldier exists in the organs of reproduction as well as in the muscular system, the digestive and circulatory systems.

When the sexual apparatus is in normal condition and healthy blood is regularly forced through the arteries and veins there exists in these organs a desire to perform the functions for which they were created.

A healthy young man therefore finds himself normally endowed with a desire for intercourse, our Army accepts only single men and many of these have not cultivated in their youth a taste for clean literature or a desire for study neither do they go in for athletics two of the ways given by which a man may successfully control his sexual appetite and as a result of this we find that "irregular intercourse has existed from the beginning of earliest recorded history and unless man's nature wholly changes, and of this we can have no hope, will continue; and venereal diseases have existed almost as long as irregular intercourse."

King Pharaoh we find in the sacred history of the Hebrews Genesis XII, 16-20 contracted some venereal disease as a result of his intercourse with Abraham's wife.

King David in the thirty-ninth Psalm records his agony as a result of syphilitic infection.

We can safely predict that we will always have gonorrhoea to treat in the Army.

The object of this paper is to recommend the Valentine treatment by irrigation, slightly modified.

This treatment has proven in civil life as well as in the Army to be the "most effective method and most in accord with modern scientific understanding of the disease."

I have treated twenty cases of primary infection and have effected a cure in from fifteen to twenty days.

There is a tendency in some military hospitals to treat the unfortunate venereal cases with indifference and they are made to feel as if they were worse than lepers.

This in my opinion is wrong and I hold that it is the duty of the surgeon and his assistants to show the same courtesy and attention to patients suffering from gonorrhoea as would be given any other surgical case. This is to the interest of the government as it loses the man's services while he is disabled. When the venereal patient appears for treatment I try to make him think by my actions and conversation that I am particularly interested in his case and tell him that I hope to cure him in two weeks and explain to him that for that reason I am putting him to bed on liquid diet and that this is not done as a punishment.

He is questioned as to the time of infection and duration of disease and as to previous attacks, etc. and a record of his case is kept and condition of patient recorded every A.M., particularly nature and amount of discharge and number of times urinated and pain attached.

He is given on admission a cathartic and the bowels are kept open. No other medicine is given in uncomplicated cases.

For the benefit of those who have not given the Valentine irrigation I will explain fully his method. A Valentine apparatus consists of glass receptacle for fluid which hangs on the wall about six feet from floor, a rubber tube same as on ordinary fountain syringe, a stopcock with a ring on it, a glass nozzle which can be sunk into the meatus about an inch.

The nozzle should not have a long thin tip but a short tip and blunt base.

Irrigations were given by me by using a fountain syringe and glass nozzle which I had among my personal instruments. Valentine's apparatus is not as yet on the supply table. Irrigations were given at 8:30 A.M. and 5:30 P.M.

First three day I gave warm sterile water, first placing patient on stool sitting close to edge of same so his sacrum was on the anterior margin of the stool and the tuberosity of the ischium slightly projecting.

A basin containing 1-2,000 bichloride and an ordinary glass urinal are placed on a table where they can be reached.

I roll my sleeves up to the elbow and protect my clothing by a rubber apron.

The patient having urinated I place a clean towel under the penis and over the scrotum.

I catch the penis with the third, fourth and fifth fingers of the left hand and support it against the thenar eminence of the same hand, leaving the thumb and index finger free for manipulation of the glans and prepuce, with the right hand I take the nozzle and wash the prepuce and glans thoroughly being careful to not overlook any little fold or pocket; then I gently insert the nozzle and irrigate the anterior urethra, allowing sufficient fluid to run through the stopcock to carry it back to the compressor.

After irrigation a bit of cotton moistened in 1-6,000 bichloride is placed over the meatus and the penis placed in a bag filled with absorbent cotton; the bag is usually a Bull Durham tobacco sack with a strip of bandage sewed to it to make it long enough and this is fastened to the suspensory bandage which is worn constantly until he is cured.

On the third day I change the fluid to potassium permanganate 1-6,000, using it twice daily.

As soon as symptoms of posterior infection appear the fluid is thrown into the bladder and when the bladder becomes moderately distended, the patient is handed the urinal and allowed to empty the bladder.

If a little care is exercised no difficulty will be experienced

in forcing the fluid into the bladder; the nozzle should be sunk into the glans far enough to keep the fluid from flowing out; the patient is directed to breathe deeply and try to urinate; this is usually sufficient to overcome the compressor muscles. On the sixth day bichloride 1-5,000 is substituted for the permanganate and then for four days they are used on alternate days. As soon as the discharge ceases which is about the fifteenth day I immediately return to the sterile water and when this causes the pus to return I alternate with the bichloride.

I use the sterile water once a day for a week after the pus has finally disappeared; this is done to wash away any pus organisms which may develop in the deep mucosa and after reaching the surface would otherwise multiply rapidly and cause a relapse. No internal medication is given because I believe the preparations of copaiba and sandal wood and other so called urinary antiseptics do more harm to digestion than they do good in restricting the bacteria in the urethra.

The patient is required to drink large quantities of water. It has been my custom to allow the patient to get up on the tenth day and his diet is increased at the same time.

This treatment was originated I believe by Dr. F. C. Valentine and I have made no change except that during the first three days when the urethra is highly inflamed and very sensitive I use only warm sterile water which thoroughly cleanses the urethra and also allays the inflammation while germicides increase the inflammation and only kill the bacteria on the surface, after the mucosa becomes less swollen the fluid enters the folds and is more effective

The days of the penis syringe and the injections that accompany it are numbered in the Army and I hope the time is not far distant when the penis syringe can be stricken from the Supply Table.

GONORRHOEA—ITS TREATMENT, FROM THE STANDPOINT OF A MILITARY SURGEON.

BY LIEUTENANT ROBERT M. THORNBURGH,
ASSISTANT SURGEON IN THE UNITED STATES ARMY.

IN bringing up this subject, I must confess that I have nothing startling to offer, either as a specific or an unfailing prophylactic but I believe that the method of treatment herein suggested, if consistently followed out, will produce as good if not better results than any routine yet reported. No originality is claimed for this combination of treatment, as it is likely used by many medical men, still it is hoped that some portion of the technic may at least prove of interest and inspire further effort in checking the ravages of this most disabling disease.

It appears scarcely in keeping with medical progress along other lines, to say that we cannot offer a cure in less than three weeks—at least in a majority of cases—yet, ask yourselves, how many of your patients, i. e. how large a percentage, are *cured* in twenty-one days or less? By “cured,” is meant absence of gonococci from the urine; absence of gonorrhoeal threads or shreds and no subsequent epididymitis, cystitis, “rheumatism” or other complication, for at least one year.

I am well aware that one year is too short a time limit in which to be assured of a perfect cure but it is seldom possible to keep a patient under observation for a longer period and when a soldier gets the gonorrhoea habit he is very likely to have a fresh attack within twelve months. I thoroughly believe that, in the large majority of cases—provided always that the patient is seen within one week from the time that discharge appears—a permanent cure may be effected.

Through the kindness of Major H. S. T. Harris, Medical Corps United States Army, I was able to obtain figures covering forty cases of gonorrhoea, treated with practically the same tech-

nic, at the post hospital, Fort Slocum, N. Y. To these cases I have added twenty-two treated last winter at Fort Warren, Mass.

The number of days lost from duty by reason of gonorrhoea exceeds that of any one disease (at one time ten percent of the command at Fort Slocum and twenty percent at Fort Warren), and for a considerable length of time, at Fort Warren, was far ahead of all other diseases and injuries put together. The importance is obvious, therefore, of returning the man to duty in the shortest possible time, consistent with safety to himself and others.

In the forty cases at Fort Slocum, the average number of days lost by sickness was 20.2. This becomes much better on analysis. Two of the cases were complicated and required fifty-two days each. One, cystitis, had had a previous attack of cystitis and should be ruled out, since he would probably have had cystitis, whatever had been the treatment employed. The other complication was by reason of returning the man to duty before the discharge had ceased and an attack of epididymitis followed in consequence. Rejecting these two cases, we get an average of 18.5 days, which is a very good result.

At Fort Warren, in the twenty-two consecutive cases that received the same treatment, the average number of days lost was 25.59. This must be reduced because all patients were kept in the hospital *seven days after all treatment had been stopped*, to avoid possibility of relapse or complication after the soldier had been returned to duty. The soldier, especially the venereal, almost invariably imbibes more or less alcohol as soon as he gets away from the restrictions of the hospital. The average 25.59 should be reduced to 18.59 by deducting the seven days that the patient has been kept under observation after all treatment has been stopped. This would make the average about the same at both hospitals.

I shall briefly outline the treatment employed, in the hope as stated above, that it might contain some slight bit of information that could be of use to the military surgeon.

On admission to hospital, a cover-glass smear is taken from the meatus and same is examined for gonococci by differential stain (Gram—decolorized with absolute alcohol—restained with

Victoria blue or Bismarck brown). If the gonococcus is found the man is put to bed and the bowels opened with a saline or calomel. The patient is caused to urinate, the root of the penis ligated with a soft rubber catheter and a twenty-five percent or a fifty percent solution of argyrol is injected into the anterior urethra. A syringeful (about 8 c.c.) is used. The entire amount is held in the urethra for ten minutes, the nurse compressing the urethra with the thumb and forefinger of his gloved left hand, just behind the meatus and with his right just before the ligature. The two hands are then brought towards each other, thus dilating the urethra and forcing the solution into the little crypts and pockets of the urethra and reaching each nidus of infection, theoretically at least. Argyrol is absolutely non-irritating and has only three drawbacks:—It is expensive, proprietary and produces a temporary stain. The latter objection is, however, of little or no importance in military practice.

In regard to the matter of expense, it would seem that if the patient is returned to duty in one or more weeks less time than in other modes of treatment, the balance is largely in favor of argyrol. If we could replace argyrol by a non-irritant, colorless, potent gonococcide, not proprietary, it would of course be an advantage but thus far nothing has come to the notice of the writer which completely fulfills these requirements, although some very good results have recently been reported, from the use of silver iodide. It may prove to possess considerable value.

The argyrol solution is used twice a day for two days and then stopped. In about twelve percent of cases the discharge stops and *never reappears* and the patient is cured in one or two days (this does not happen when the penis has been "running" more than a week). If the discharge continues, the injection is given in the same manner four times daily but reduced to ten percent, since there is no longer any hope of aborting the disease. At the onset, the patient is put on milk diet and this is continued for one week. At the end of the first week, the discharge, if there be any, is examined for gonococci. If none are found, the injection is changed to an astringent injection to cure the now non-specific urethritis. I use an old stand-by that is doubtless familiar to all of you.

R	Zinci sulphatis,	.500
	Morph. sulphatis,	.300
	Aquae	250
M.	Sig: Inject four times daily as directed.	

In addition to the local treatment, the following capsule is given by the mouth from time of admission to hospital until gonococci disappear from the urine, unless the patient is rendered uncomfortable thereby, when the dose is reduced. It was well tolerated by all the twenty-two cases reported here.

R	Methylene blue	.125
	Oil nutmeg	.130
	Oil santal	.300
M.	Ft. capsul. No. 1	Sig. 1 t. i. d.

At the end of the first week the patient is allowed out of bed and light diet prescribed. The zinc solution is continued until two days after discharge ceases (usually from the tenth to fifteenth day after admission to hospital) and the patient kept in hospital, under observation with full diet and without any treatment, for seven days from time injections were stopped. Provided no relapse occurs, he is then returned to duty. In none of these cases where the above treatment was carried out has there been any relapse or complication.

Before closing, it is of interest to cite a case of gonorrhoeal ophthalmia that occurred at this post about one year ago. The gonococci were found in enormous quantities in the eye pus. The patient was put on instillations of fifty percent argyrol solution every two hours. This was washed out five minutes later with warm normal salt solution. Patient was cured in one week. No infection of sound eye, no coloring of conjunctiva; no damage to vision and absolutely no irritation caused by the solution.

To summarize briefly:—Absolute rest in bed with liquid diet and laxatives for one week; twenty-five percent to fifty percent argyrol injections for two days; ten percent argyrol for five days, or until no gonococci can be found and then 1-500 zinc sulphate injections until two days after discharge ceases. Methylene blue capsules from beginning of case until disappearance of gonococci.

It is worthy of note that in a series of parallel cases before these reported, methylene blue and urotropin were tried side by side with results greatly in favor of the methylene blue.

THE QUESTION OF THE ORIGIN OF THE LUES
VENEREA AMONG THE CONQUISTADORES
IN MEXICO.

By CAPTAIN HENRY DU REST PHELAN,
FORMERLY ASSISTANT SURGEON OF UNITED STATES VOLUNTEERS.

AFTER the lapse of two years since I severed my connection with the United States Army, it is with hesitation that I again venture into the field of military medicine. It is this feeling which has caused me to postpone to the last moment the performance of a duty which all zealous members owe to the Association of Military Surgeons to contribute to the success of its meetings. I must confess that I was also greatly embarrassed as to the choice of a topic upon which to discourse until a short time ago, when my attention was directed to a chapter of a historical work that I am reading, wherein certain inferences are drawn to which I take exception; and to my adverse opinion alone the following lines are due. The question at issue, I must admit, is of no vital importance today, and can scarcely justify an excuse for trespassing on the time of my readers, owing to the fact that it takes us back nearly four hundred years into the past, a past so full of historical interest, and concerns the doings of a band of warriors the like of which cannot be found in modern times.

Syphilis, a loathsome disease per se, one whose name even inspires disgust and horror, is nevertheless entitled to some consideration if only for its great antiquity. It would be folly for me to attempt to trace its pedigree, soiled though it be, through past ages, and to endeavor to settle the disputed question as to its original source, both as regards sex or country. Suffice it to say that in the past as in the present, syphilis was and still is the unsought gift which too often accompanies certain daily exchanges of courtesies between the sexes.

It is still a debatable question whether syphilis was introduced into Europe by the returning discoverers of this continent, or whether it was first spread over our shores by the followers of Hernando Cortez. In the sixteenth century, when the disease ravaged continental Europe, especially Italy, where it followed in the wake of the invading army of Charles VIII of France, it was commonly known as *Morbus Gallicus*, the odium of its paternity being generally fixed upon the French. By other people, presumably by the French, it was qualified as *Morbus Germanicus*, a natural enemy being, it would seem, the proper fountain head for a loathsome disease. Though syphilis went under various other aliases, one has yet to hear it described as *Morbus Mexicanus*. And yet, an ungallant European, in an endeavor to shield his own countrymen from the odium of being the reputed fathers of the ill-famed *Morbus Gallicus*, has, through a tortuous route and the handy interpretation of a word in general use among the Spanish soldiers of the sixteenth century, fixed the blame for the spread of the disease throughout Cortez' army upon the unoffending Mexican maidens. We all know of the advent of the Spanish into Mexico, thanks to the relations left us by the Conquistadores themselves, among whom was Captain Bernal Diaz del Castillo, and by later authors as well.

Bernal Diaz, in his relation of the campaigns of Cortez, speaks among other things, of a peculiar ailment which affected many of the soldiers. Commenting on the description given of this malady, a learned Frenchman*, some thirty years ago, arrived at the conclusion that it was undoubtedly syphilis. Moreover, he was equally certain that the Mexican girls must shoulder the responsibility for having laid low so many of their conquerors.

It is a difficult task indeed, though chivalrous it be, to undertake the defense of the accused maidens and of the perhaps continent Castilian warriors, when so far away, both in point of time and place, from the scenes of their thrilling exploits and reverses. An easier task is perhaps that of picking to pieces the

*"Les Syphilitiques de la Campagne de Fernand Cortez", dans l' "Histoire Veridique de la Conquete de la Nouvelle Espagne par le Capitaine Bernal Diaz del Castillo." Traduction par D. Jourdanet, pages 903 et seq. Paris, 1877.

Frenchman's conclusions; and it is the latter course which I propose to follow.

The verdict of the learned man above quoted, is based mainly upon one particular fact to which he incessantly reverts, that those afflicted with this malady were fond of taking a bath. Ergo, it was syphilis.

From the narration of Bernal Diaz, we gather that Hernando Cortez sailed from Cuba on February 10, 1519, at the head of 508 soldiers, among whom no Amazones were counted, and that he reached Mexico City November 8, 1519. Therefore, during this period of nine months when the invaders had much else to attend to than the worship of Venus, they could not have contracted any venereal disease from European sources.

On November 12, 1519, through the courtesy of Montezuma, Cortez and a few followers visited an Aztec temple within the City of Mexico. One hundred and fourteen steps led up to the shrine. While desending this stairway, several of the visitors complained of severe pains in their groins and thighs which were covered with sores and *bubas*. This is the first occasion on which Bernal Diaz speaks of bubas.

Nine months later, or eighteen months after their departure from Cuba, seven soldiers came up from Vera Cruz to the City of Mexico, after a dreary march, with tidings from the Commandante of the former town. Of these seven soldiers, five were suffering from bubas, and the two remaining presented swollen bellies. Their pitiful appearance, instead of exciting the sympathy of their comrades, caused the sufferers to be ridiculed as being questionable reinforcements.

From this it would appear that the soldiers who were operating in the low lands or Tierra Caliente, were in a poorer physical condition than those who were quartered in the Capital. And yet, among the entourage of Cortez there were many sufferers, some of them men of note, such as Capitan Rodrigo Rangel, who proved to be of no military value, being, in the language of the historian, "always ill, suffering great pain from bubas, quite undone, with long emaciated legs covered with ulcers, the body and head studded with sores." The brave captain cried with

pain due to the bubas, and slept neither night nor day till he died. Herman Lopez de Avila is quoted as another sufferer from great pain, and whose body was a mass of bubas. He recovered, however, and hastened back to Spain.

Andres de Monjaraz, who was present at the siege of Mexico, was also covered with bubas, to the extent of being incapacitated for duty during the rest of his short life. Marcos de Aguilar, who succeeded to Luis Ponce de Leon in the government of Mexico, was also a sufferer from bubas and from fever, from which he died. Previous to his coming to Mexico, he had resided in Santo Domingo, where he possibly contracted the malady which ended his career.

Francisco de Orozco, who formerly lived in Italy, was also suffering from bubas. Juan del Puerto, a soldier, died of bubas. Maldonado also had them; and so had many others. The diagnosis of this malady hinges upon the interpretation given to this word *Bubas*. It is difficult after a lapse of several centuries, to grasp the exact meaning of a word or the true value of an expression then in use. Was Bubas a synonym for Syphilis? The learned accuser of the Mexican girls inclines to such an interpretation. To me, a lesser light, to be sure, but nevertheless as anxious to abide by the truth as to uphold the good name of the maidens of the Aztec, Totonac and many other tribes, as well as the dignity of the Conquistadores themselves, against the suspicion of an excess of gallantry ill repaid, a contrary opinion seems justifiable.

Bubas, nowadays, as it probably was in the sixteenth century, is a popular term for any glandular swelling, irrespective of its origin, whether syphilitic or not. I feel satisfied that our Mexican confrères share my belief that such is the vulgar name for an adenitis among the mass of the people today.

Therefore, if we assume that the Conquistadores, after their tedious march through the tierra caliente, arrived in Mexico covered with ulcers and bubas, were not syphilitics, what was the nature of their painful ailment? While I cannot presume to answer this question positively, yet, from the nature of the expedition, the climate of the low lands, the symptoms of the disease and the name by which it was known, I am inclined to the belief

that it was one which, though resembling syphilis in certain of its manifestations, is nevertheless absolutely non-venereal. I refer to Pian or Framboesia, also called Bubas. Framboesia is a tropical disease which often ends in death. It has many symptoms in common with syphilis and may co-exist with syphilis. It is inoculable and is accompanied with adenitis, at times simple; at others purulent. The internal organs are also affected as well as the muscles, cartilages and bones.

Though with our modern diagnostic methods we might readily differentiate the two diseases, it would have required, in my opinion, abler diagnosticians than were the Conquistadores of the sixteenth century, to have differentiated syphilis from framboesia.

The buboes, the ulcers, the pains in the bones and in the joints, which the soldiers complained of, and for the relief of which they sought warm baths, could as well have been due to framboesia as to syphilis.

In the absence of any possible contact with European women, in the face of the improbability of the Mexicans being at that time infected with syphilis, notwithstanding the attempts made in these days to trace the existence of syphilis in America to pre-historic ages, through the appearance of certain bones of aborigines recently exhumed, the prevalence of framboesia in tropical countries such as those traversed by the Spaniards, all point to the latter disease and not to syphilis.

Framboesia was reported in Santo Domingo in 1535, but this does not disprove its presence in that island during the time Marcos de Aguilar was stationed there. If it existed in the Antilles, it was to be found in all probability on the mainland as well, where it was perhaps introduced by the invaders themselves.

Again, those who have followed our soldiers during these past few years in their wanderings over the Philippine Islands, cannot fail to recall how they emerged from the tropical jungles with legs and feet scratched and torn, and covered with sores often accompanied with adenitis of positive non-venereal origin. If, in spite of our modern hygienic measures, of our medical and surgical skill, our soldiers suffered from ulcers and adenitis, how

can we wonder at the infected sores that the Conquistadores complained of after a tedious march of many months duration, considering the lack of provision for their welfare so common in those days?

But, if such contradictory evidence as I have just introduced is insufficient to disprove the identity of Syphilis and Bubas, let us accept the following remarkable instance of exemplary virtue as a final argument.

Geronimo de Aguilar, who was wrecked on the coast of Yucatan a number of years before the arrival of Cortez, was held in captivity by a Cacique. After eight years of servitude, he regained his liberty, and, joining the expedition of Cortez at Cozumel, he took part in the conquest of Mexico, where he subsequently died of bubas.

Though from long disuse, he had almost forgotten his mother tongue when rescued, he soon afterward recovered its use sufficiently to narrate the following story which is said to have caused the great Cortez to smile.

Faithful to a vow of chastity made in Spain, upon the receipt of the minor orders, Aguilar assured Cortez that he had never glanced at a woman during the eight years of his captivity. In the presence of the dusky maidens, he would invariably gaze at the uninspiring soil. To put an end to such an unheard of state of affairs, the Cacique, one day, sent Aguilar on a fishing expedition with a pretty maiden as a sole companion. As night overcame them, the bewitching siren, skillful in the art of capturing hearts, vainly attempted to have her companion share with her the single hammock provided for both. Aguilar chose to sleep upon the cold sand. Through the irony of fate, this same chaste Aguilar died himself of bubas.

In bringing up this question, which is one of purely historical interest, I do it with the hope that it will lead to a discussion of the prevalence of framboesia in tropical Mexico, of the history of syphilis in the American continent previous to its discovery, and especially that it may bring forth from our esteemed Mexican confrères conclusive evidence that the Mexican women were not instrumental in spreading loathsome diseases throughout the ranks of the invading army of Hernando Cortez.

A SUGGESTION FOR THE GREATER EFFICIENCY OF THE ORGANIZED MILITIA.

By CAPTAIN CHARLES S. BUTLER,

ASSISTANT SURGEON IN THE MASSACHUSETTS VOLUNTEER MILITIA., ASSISTANT IN ANATOMY, HARVARD MEDICAL SCHOOL;
ASSISTANT TO SURGEONS, MASSACHUSETTS GENERAL
HOSPITAL.

THE importance of military hygiene in its relation to the efficiency of a regiment is emphasized again and again, as often as armies operate in the field. Recent reports of the chief surgeon of General Oku's army as well as other medical reports from Japan prove the good results to an army in saving life by practical sanitary precautions. On the other hand, recent statements on the conditions in the Russian army in Manchuria, as well as the reports of the British troops in the Anglo-Boer war, serve to emphasize still more the inevitable results in disease and deaths, from ignorance and carelessness in matters of hygiene. The lesson was taught us in the late Spanish war of 1898, where in five months of nominal hostilities the United States lost about 350 men killed, but over 2,500 dead by disease. In the wars of the past fifty years there has always been a great disproportion between deaths by bullets and deaths from disease. The ratio of deaths from casualties to those from disease in several wars has been:

Crimean War, (1854)	1 to 4
Civil War, U.S. (1861-65 North)	1 to 2
Civil War, U.S. (1861-65 South)	1 to 3
Russo-Turkish War, (1878)	1 to 7
Spanish-American War, (1898)	1 to 8

In the United States the value of instruction for officers of the line in the principles of military hygiene has been clearly recognized. Every surgeon of experience has seen the necessity of such teaching, not alone in the regular army, but more particularly in the organized militia of the states. During the present

year, a chair of military hygiene has been established at West Point, and the professor has been made a member of the Academic Board. This is a wise provision, and, if carried thoroughly into practice, one sure to return great good to the army. The preservation of the health of the enlisted men is hardly second in importance to the defeat of the enemy; in fact the defeat of the enemy depends in no small degree on the former. Appreciating the force of this, the Association of Military Surgeons of the United States, as late as 1904: "Resolved that this Association believes that an adequate knowledge of the 'care of troops' is of such vital importance to an army that it should be given adequate recognition in all our Army and Navy Schools and especially in the staff college and war colleges; and that the present courses at West Point and Annapolis should count in the requirements for graduation."

It has seemed to me that line officers of the volunteer militia, in spite of the severe lessons of the Spanish war camps, fail to enforce the practical application of the principles of military hygiene. Perhaps some officers are ignorant of them; probably many are unwilling to take the trouble. The regimental surgeons are depended on to cure every disease as it appears; indeed in the minds of many, disease is an inevitable camp follower; something not to be ashamed of, but to be endured as a necessity. This feeling, however, and the consequent inaction of officers and men alike, are unreasonable and demoralizing to a regiment; and should be strongly combated by all medical officers.

A promising field of endeavor offers, then, among the organized militia for instruction to officers and enlisted men in the care of the health of troops. The salient facts, touching the principles of preventive medicine, are more and more common knowledge; they apply to those living in towns, as well as to those in the army. Moreover, in the national guard of the states, we find men usually of good intelligence and youthful enthusiasm, men among whom such instruction would be well received. This instruction could be given by talks and lectures, practical and to the point,—brief but interesting, remembering, however, that it will be of little value in theory to officers or men, unless the

lessons are enforced in practice. All such instruction looks forward to its application in time of war. The enlisted men of the national guard are, as a general thing, either careless or ignorant of the principles of personal hygiene. In their summer encampment, the idea prevails too widely of making it a week of play or an easy outing. Too little suggestion is offered of preparation for active or campaign service. We have so quickly forgotten the lessons of the past.

In the Spanish war of 1898, every regiment of the first, second, third, fourth, fifth and seventh army corps had typhoid fever; camp pollution was the worst sin committed; and was widespread among the volunteers. This was an unnecessary and expensive waste of men. Ignorance and lack of discipline both contribute to the result; nor is all the blame on the enlisted men; in fact, in some of the volunteer regiments, the line-officers were as careless in the practice of matters of camp and personal hygiene. Such a condition is surely not as it should be; it is a weak spot in our organized militia, to be corrected as soon as possible. The surgeons must look to the line-officers, as well as to the enlisted men, for cooperation in carrying out fully all sanitary precautions. Military efficiency is crippled more by disease than by battle.

It would, therefore, be a wise precaution to introduce systematic instruction in hygiene for the men of the organized militia; to be given by the regimental surgeons in lectures, informal talks, and demonstrations. A knowledge of even a few of the cardinal points of personal and military hygiene would increase the efficiency and add strength to the system of defence. The President in his message to Congress in January, 1905, has said: "Our army should, in every part, be brought to the highest point of efficiency." This can be applied as well to the volunteers. These talks, then, of ten or fifteen minutes each could be given, as opportunity offered during the winter and spring evenings; and as often as seemed practical with three surgeons and twelve companies to a regiment. If four, or more, short lectures were given to each company, in the armories, where the light is good and the men are accustomed to feel at home, that would be enough to cover much in the field of useful hygiene. This instruction

should cover the following points: the water-supply and the dangers of impure drinking water; camp pollution and its results, with examples to drive the lesson home; how to care for the health on the march; care of the feet, especially with soft troops, with lessons learned in manoeuvre camps of Manassas and elsewhere; considerations of diet, with instructions how to cook; the value of personal cleanliness; bathing; the necessity of fresh air and ventilation; sunlight; the value of physical training and athletics; the qualities of a good soldier, including health, strength and physical endurance; nor should reference be omitted to any excesses including alcohol; and particular stress should be put on the far reaching evils of venereal disease.

It is true objections can be raised to this suggestion. Perhaps the most serious is the liability of making the enlisted men feel that the little instruction transforms them into hospital corps men. My answer is this: in the talks, stress should be put on the reasons for the instruction; that is, to protect each one and the lives of all; to prevent disease; not to make doctors or nurses. In addition, I have purposely omitted reference to first aid; or the treatment of the injured. The object now is quite different. Moreover it would be unwise to attempt too much; the enlisted men would lose interest. It is better to go slowly than to cover so much ground as to overwhelm them with details of a new subject. To be most effective, the instruction in matters of hygiene must appeal to their own self interest and intelligence. Another objection, that men will not take interest, or will not profit by the lessons, is, I believe, erroneous. Perhaps the very best answer to that is this, the militia does not want men who will not take an interest in keeping well. A regiment of only 500 who are well and keep well is stronger than a regiment of 1,000 men, half of whom are in the hospital. Again, anything which will help the men, not alone in military, but also in daily life, appeals to their good sense. They are usually keen to see the wisdom; and quick to note the practical application to self.

Having seen good results from a few lectures, I can recommend this suggestion, from personal experience. Although my own talks have not covered as much ground as is advisable, nor was opportunity given me to continue as long as seemed best,

yet something was accomplished. At the time of the lectures, the men were attentive; and at the end, some asked questions, suggesting an honest and understanding interest. Such behavior makes me feel that still greater benefit would result both to individual and to regimental organization, if more systematic instruction be given. In addition to the lectures, much could be done to impress the men with the salient points of the subject by printed circulars. These could be distributed in the companies, and posted in conspicuous places in the recreation or reading rooms of the armories. Although the men of the organized militia are of good intelligence, yet their age and their inexperience under actual field conditions of military life, necessitate treating them almost as children. I do not mean they cannot do their work; but I mean they must be taught to do their duty, and then even compelled to do it. Under the present subject, their duty is to keep well; and let others keep well. To get the best results from the lectures some method of inspection by regimental surgeons is advisable. These inspections should include not only matters of personal hygiene, but also some understanding of the essential points of the lectures. Such knowledge would be of use to the men not only in actual field operations, but also because, as citizens in the daily life of our towns, it would spread useful facts throughout the community.

REDUCTION OF THE AGE OF ENLISTMENT.

IN all other armies, says Captain Hans Daae (*Norsk tidsskrift for militær medicin*), the lower limit of age for military service is lower than in Norway where it is twenty-three years. It is however a well substantiated fact that at this age the Norwegians are exceedingly well developed. They are the tallest soldiers in the world. The minimum height of a military man is 159 cm., while the average is 170.5 cm. It is proposed to reduce the age of enlistment to twenty-one, and the minimum height to 157 cm. From a medical standpoint there is no objection to this change and from the social and economic view the acceptance of the proposal will be very useful.—HANS DAAE.

CALX SULPHURATA U.S.P., AS A PREVENTIVE OF YELLOW FEVER.

By WILLIAM FRANCIS WAUGH, A.M., M.D.,

FORMERLY ASSISTANT SURGEON IN THE UNITED STATES NAVY.

IN studying the reports made by the yellow fever commission in Havana, my attention was attracted by the statement that in some instances the mosquitoes could not be induced to bite certain persons. No explanation of this singular fact was offered, although its importance could hardly have failed to be appreciated by the distinguished scientists who were conducting the experiments.

About this time a pharmacist, writing to me from Alaska, stated that people there were in the habit of applying to the exposed portions of their skin, solutions of calcium sulphide (calx sulphurata U.S.P.) before going into the open air, during the period when the mosquitoes were active. By this means they enjoyed immunity from these ferocious insects.

It occurred to me that there might be some correlation between these two facts; and if so, an explanation might also be given to one of the strongest objections yet raised against the theory which attributes the conveyance of malaria, to the human being, exclusively to the mosquito. Many physicians adhere stubbornly to the belief that malaria is conveyed by infected water. The following account is typical of the evidence on which this belief is based. During the construction of the Yazoo and Mississippi Valley Railroad, malaria prevailed among the laborers to such an extent that at one time it was thought the work would have to be abandoned. The laborers were in the habit of drinking water from the bayous. Artesian water was introduced, however, and from that time there was no further trouble with malaria excepting among the conservatives who stubbornly persisted in drinking bayou water. The very natural inference was made that the bayou water caused malaria.

The artesian waters of the Mississippi Valley are generally notable for the odor of sulphuretted hydrogen which they emit. It is well known that such waters have very high solvent properties and are apt to be highly charged with mineral matters. Most of the artesian waters in the city of Memphis, and that at the Grunewald Hotel in New Orleans, give off this odor unmistakably. May it not have been that the sulphides in the artesian water so highly charged the body of the user as to render him proof against the mosquito and hence against the malaria which it would otherwise have imparted to him?

Calcium Sulphide is being widely used as a remedy for infectious maladies. It is claimed that when the human body has become so saturated with this drug that the sulphide odor may be detected on the breath and in the perspiration, no known microorganism can exist in the body; furthermore, that no insect, mosquito, flea, fly, pediculus, jigger, red bug, bedbug, or any other insect pest, will bite or remain upon the person of an individual as long as he is thus saturated. This saturation has been abundantly proved to be absolutely harmless, even to an infant. There is no danger and very little expense incurred by making this experiment; and if it proves to be successful its importance is almost beyond calculation. During the last summer I sent supplies of calcium sulphide to a number of friends residing in Louisiana, and each one has reported that saturation therewith rendered him immune against the mosquitoes of his locality.

Calcium Sulphide is best given in small doses, from one-sixth to one-half grain, repeated every half hour, until the characteristic odor indicates the saturation of the patient. If given in too large a dose it will cause nausea; if given during the period of acid digestion the sulphide will be decomposed, with disagreeable eructations of sulphuretted hydrogen. Twenty-four hours is sufficient time in which to produce saturation.

It is essential that the sulphide should be of good quality. The U. S. Pharmacopoeia requires a strength of sixty per cent of pure calcium sulphide. But in an investigation of all brands of pills and granules found in the market of Chicago, but one proved

to be up to the official standard. Some of the others were absolutely devoid of even the odor of the drug. It is one of the most difficult substances for pharmaceutic handling, and at least one large manufacturing house struck it off their list, finding it impossible to prepare a satisfactory article containing the full standard strength and retaining it under ordinary vicissitudes of pharmaceutic handling. I would respectfully urge that this matter be given a thorough test during any future epidemic of yellow fever; since if the idea proves well founded there is no longer any reason for quarantine, or for the continued prevalence of yellow fever or malaria among physicians, or other persons whose duties compel them to be exposed to the attacks of possibly infected mosquitoes.

While waiting for saturation to be completed it would be wise to apply the drug externally before going into the infected districts. For this purpose eighteen grains of the best sulphide should be dissolved in an ounce of glycerine and two ounces of water, and this applied to every exposed part of the skin freely. The odor is unpleasant but this scarcely weighs against the fact of protection. After saturation is evident it may be sustained by about five grains a day of the sulphide.

THE DIET OF THE NORWEGIAN NAVY.

THE Norwegian sailor now receives for his supper, says Lieutenant Manthey (*Norsk tidsskrift for militær medicin*), gruel or stirabout, lobsouse, corned beef, or preserved meat; for dinner, twice a week fresh, twice preserved, and twice salted meat, caloric value per day, about 5,000. For breakfast the sailor receives coffee and bread and butter; for dinner salted or fresh fish, or meat and soup; for supper tea, bread and butter, and the above mentioned additions.—HANS DAAE.

OTITIS MEDIA AND MASTOIDITIS AS A SEQUEL OF INFLUENZA.

BY LIEUTENANT CHARLES D. CENTER,

QUINCY, ILLINOIS.

ASSISTANT SURGEON IN THE ILLINOIS NATIONAL GUARD.

THERE is comparatively little given in detail, in medical literature, bearing upon this subject. There are numerous references to it, and it may be that otitis media, and subsequent mastoiditis, are of such common occurrence that their development as influenza sequelae is accepted as a matter of course.

As one author says, "the manifestations and complications of influenza are protean." In some ways it is an extremely versatile, or adaptable disease. It has its favorite seat for attack, but failing to storm this one of Nature's citadels it turns its attention with equal facility to another.

In 1891 or 1892 Pfeiffer succeeded in isolating, recognizing and cultivating the bacillus of influenza, gave it his name, and this bacillus is now generally accepted as the cause of the disease. This bacillus is not tenacious of life under slightly adverse conditions. It is aerobic. When dried it is practically innocuous. It must be transferred, as active contagion, in a moist medium. It cannot be transferred to the domestic animals other than the guinea pig. It requires haemoglobin, or oxy-haemoglobin, for its existence and propagation. It is probable that it requires the oxy-haemoglobin, although I could find no experiments in this line, but as even venous blood carries a considerable proportion of oxygen, and the bacillus is aerobic, it is reasonable to suppose oxy-haemoglobin is necessary. It must be cultivated artificially on a haemoglobin medium, and Pfeiffer found smear cultures on haemoglobin-agar the best culture field. He also found that the development and growth was most vigorous in a pigeon blood-

agar medium—the blood of the pigeon being especially rich in haemoglobin. This minute bacillus, smaller than the bacillus of tuberculosis, takes practically all of the ordinary stains except Gram's.

The Pfeiffer bacillus takes the air passages as its favorite infection-portals. Here it may involve any portion, or all portions, from the nose to the air cell in the lung. This is the ordinary type of influenza, and may reach from an influenza coryza to an influenza pneumonia. On the other hand, the locus minoris resistentiae in a given patient may prove to be another point than the air passages, and there may be a nervous or cerebral type of influenza running from headache to meningitis, encephalitis and brain abscess. Still another patient will have the gastro-enteric type, and have any symptoms from abdominal pain and vomiting to diarrhoea and collapse.

But this insatiable pest is not yet satisfied. Baumgarten calls attention to the frequency of nephritis in influenza. Other observers have noted endocarditis, pericarditis, conjunctivitis, iritis, and optic neuritis as results of its presence, and Osler and Butler say that acute otitis media is common. It will be noticed that in the large majority of its diversified attacks, that the bacillus directs its energies toward either the mucous or serous membranes. It prefers the thin delicate structures rich in red blood corpuscles, rich in secreting cells and crypts, and poor in fibrous connective tissue.

Now, the bacillus of Pfeiffer is not, in the strict sense of the word, a pus microbe. It is, however, a gregarious microbe, and mingles contentedly with the diplococcus of Fraenkel, the diplobacillus of Friedlander, the ordinary pus strepto-, and staphylococcus, and the tubercle bacillus.

It is a well accepted fact that we have with us, and normally so, many of the more common forms of microbic life, at one or another part of the body, all the time, and there is no question that the presence of the infectious secretions in the pharynx is a constant menace to the middle ear. The nasal secretion is said to be capable, normally, of caring for the bacteria that may enter the nasal channels, but when this bacterial infection is abnormally

increased, or becomes unusually virulent, or when the nasal secretion for any reason loses its normal power the nasal passage with its auxiliary channels, contain a superabundance of infection. There is no doubt that the diplococcus, the streptococcus, and the staphylococcus are usually present in the nasal secretions, as well as other forms of bacterial life of less importance, or of more unusual occurrence. The usual route for the generation of an otitis media, and a subsequent mastoiditis, is through the Eustachian tube. In an otitis media, following influenza it is safe to say it is the route taken by the infection, although some few observers have noted an extension from an influenza parotitis. The Eustachian tube, in length from one and one-half to two inches, lined with mucous membrane, flaring trumpet like, at each end, leads in a direction upward, backward and outward, the lower end opening on a plane between the middle and inferior turbinate bones, to the anterior surface of the middle ear or tympanum. Its lining membrane is, at the pharyngeal end, continuous with that of the pharynx. At the tympanum it is continuous with the tympanic mucous membrane, which in turn continues to form the lining of the mastoid cells lying posterior to the middle ear, so that in a certain sense it may be said that the Eustachian tube, the middle ear, and the mastoid cells are auxiliary cavities of the nasal passages.

Many ears in this climate are catarrhal, *i. e.* the Eustachian tube, the middle ear, and even the mucous membrane of the mastoid cells suffer from chronic hyperaemia. Furthermore, many nasal passages in this climate are subject to adenoids, not necessarily the massive development sufficient to cause the characteristic facies, but sufficient to alter the character of the lining membrane of the pharynx and to interfere with the physiologic action of its secretion. One of the favorite seats for adenoid development is a ring about the nasal orifice of the Eustachian tube. It now seems that from a logical standpoint the way has been made easy for an infection of the middle ear and the mastoid cells, and particularly easy for the bacillus of influenza whose favorite habitat is the mucous membrane of the respiratory channels. The different steps leading to this influenza otitis may

be placed like this: a more or less chronic catarrhal condition of the pharyngeal mucous membrane; a more or less adenoidous development of the pharynx and the orifice of the Eustachian tube; consequent change in the mucous membrane of the pharynx and tube, this change interfering with the normal anti-bacillary action of the mucous membrane secretion. The continuous presence of one or more of the common pus microbes in this altered secretion. The arrival of a vigorous, if not virulent bacillary infection by the Pfeiffer bacillus, diminished systemic resistance—or lacking this—diminished tissue resistance locally, influenza infection at the pharyngeal opening of the Eustachian tube, extension by continuity up the tube to the tympanum, or forced extension, or transmission, perhaps by violent blowing of the nose, or by the use of a nasal douche, and we arrive at the otitis media, caused no doubt by the admixture of the Pfeiffer bacillus with the diplococcus, the streptococcus, or the staphylococcus.

The pathologic changes that take place in the tympanum are as follows: Hyperaemia, round cell infiltration, exudation of mucus or muco-pus. If the infection is a virulent one there will likely be exfoliation of the tympanic mucosa, this same mucosa serving as periosteum for the bony wall of the tympanum, and the destruction of the mucosa, or periosteum, has the same result as periosteal death elsewhere, necrosis of bone, in this case the parts suffering being the tympanic walls and the ossicles. Nor is the end yet reached, for the bony rampart between the lateral sinus and the meninges on the one hand, and the tympanum and the mastoid cells on the other is extremely frail and thin and is perforated by openings for blood vessels. Into these openings dips the mucosa from the tympanum carrying with it perhaps the influenza infection to cause either sinus involvement with thrombus, meningitis, or encephalitis.

With your permission let me cite a few cases of influenza otitis and mastoiditis, calling your attention to three points of interest. First, the comparatively short time from the beginning of the attack of influenza to the development of symptoms of otitis or mastoiditis. Second, the slight pain experienced by these cases when the abscess was limited to the middle ear, and the readiness,

with which, in at least one case, the membrana tympani ruptured. One other case apparently had this painless or practically painless rupture, but as he gave past history of repeated attacks of tonsillitis it is possible his drums were the seat of an old and permanent opening. Third, the fact that these cases would tend to show that persons of any age are liable to the disease.

Case 1. Male, age 46. Switchman. Good personal and family history. No previous throat and ear trouble. Earache began the second day of his attack of influenza, with tenderness over the mastoid from the first. An ice bag was used locally with no good result; hot applications however afforded considerable relief. He hooted at the idea of an operation. The pulse and temperature remained practically normal for four days, and during this time the patient did not miss a meal, but slept poorly because of the pain. The fifth day the pain suddenly increased, the temperature rose, and the swelling behind, below and above the external ear increased rapidly. He was sent to the hospital for operation. While being prepared the membrana tympani ruptured and considerable pus escaped, affording him relief. He then again refused operation, and now some three months later the mastoid is painful on percussion, and he complains of sharp, shooting pains behind and above the ear.

Case 2. Female, age 3. Patient sick for two weeks when she first came under my care. Former attendant had made diagnosis of gripe. The child had complained of her throat and ear from the third day of her sickness. Condition when first seen one of mild coma. She could be roused but not to apparent consciousness, and could be roused best by percussion over and above the right mastoid. The pupils were slightly dilated and were uneven. Tonsils enlarged but clean. Urine normal. Swelling behind right ear. Pulse 120 and irregular. Temperature 120° F. There was considerable rigidity of the cervical muscles, but no jugular prominence. A working diagnosis of mastoiditis with probable extension of the inflammation to the meninges, and perhaps a cerebral abscess, was made. An unfavorable prognosis was given, but opening and draining the mastoid, with possibly an auxiliary opening to drain the brain cavity was advised, and this course of treatment was concurred in by my colleague who was called in consultation. The mastoid opening showed but little pus, and a second one was made behind and above the ear where excessive cerebral pressure was discovered. The aspirating needle failed to disclose pus here. Both

openings were drained, but the patient never recovered consciousness, and thirty-eight hours later developed convulsions and died. No autopsy could be obtained.

Case 3. Male, age 4. Previous health good except that "he took cold easily." He is a child of heavy, lymphatic type, with no animation in the countenance. Three weeks before his attack of influenza he had a mild attack of scarlet fever, with unusually slight throat symptoms. Three days after the beginning of his influenza, without any previous complaint on the part of the child, each ear drum ruptured and discharged freely. Under antiseptic washes one yielded promptly to treatment. The other extended to the mastoid, without pain, with but little temperature, and while discharging freely. Seventeen days after the appearance of the otitis media I opened and drained the mastoid and recovery followed promptly.

Case 4. Male, age 28. Bartender. History of syphilis, and repeated attacks of tonsillitis. The characteristic symptoms of an attack of influenza began Saturday evening. The patient was seen first the following morning, when all he complained of was backache, nausea, and frontal headache. I saw him again Monday morning and was astonished when he told me each ear was running. The ears began to ache Sunday night, and early in the morning each one broke. With antiseptic washes they were well in two weeks, but he is left quite deaf.

Case 5. Male, age 36. Laborer. First seen after he had been sick for three weeks. He gave a history of the ordinary symptoms of grippe, which in about one week developed earache in both ears. Still later the ears began to discharge pus. One ear took care of itself, but the other continued to run, and the pain to increase. Two days before I first saw him the pain grew violently worse, and his attendant resorted to sufficient opiate of some sort to keep him asleep most of the time, but delirious from pain and sepsis. When first seen the external ear stood out at right angles to the head. The swelling extended completely around the ear, but was greatest in the region of the zygoma. The patient was removed to the hospital, where, because of my absence, he was operated by a colleague. Draining and cleaning the mastoid cells resulted in complete recovery.

TREATMENT OF FRACTURED RIBS.

By RELL M. WOODWARD, M. D.

SURGEON IN THE PUBLIC HEALTH AND MARINE HOSPITAL
SERVICE OF THE UNITED STATES.

THE principle of strapping the chest with adhesive plaster in a case of rib fracture is very old, and my reason for presenting this article is the fact that the numerous cases admitted to the United States Marine Hospital at Boston, which have been dressed elsewhere show that the rationale of the treatment is not understood by all physicians, it apparently being the impression with many that the application of a piece of adhesive plaster of almost any size or shape directly over the seat of fracture is all that is necessary. Cases have been admitted which were dressed with one piece of plaster probably three by eight inches. Usually one strip about five inches wide is applied directly around the chest, seldom reaching from the mid-line in front to the mid-line behind. Very few have shown overlapping strips, and these few only over the seat of fracture. I do not recall having seen a case with any protection whatever save that outlined above.

The main object in strapping the chest is, as in all fractures, to immobilize the fragments of the broken bone or bones, in so far as is consistent with the carrying out of the normal functions of the part, in this case particularly the respiration. To accomplish this in rib fracture, several elements are necessary.

1. The plaster must have excellent adhesive qualities to prevent it being detached during the several weeks necessary for the union of the bone.

2. The plaster must be applied with some tension, and must reach at least from the mid-line in front to the mid-line behind, preferably a little beyond these lines, and must be applied well above and below the seat of fracture to immobilize the adjacent ribs.

3. The plaster must be covered by a protective dressing or it is apt to loosen at the edges, adhere to the clothing, and possibly slip upon the skin.

4. A jacket of some stiff material applied over this protective dressing, while not absolutely essential, certainly assists in holding the fragments, as is evidenced by the ease experienced by the patient immediately upon its application, and thereby hastens union.

After making the examination and locating the fracture, I have the patient sit on a stool if he is able or preferably stand up.



Fig. 1. Application of Strips of Plaster.

The skin is scrubbed with alcohol or ether to remove all the oily material therefrom. The plaster which I have found best for the purpose is that known to the trade as Z O plaster. The width of the strips to be employed varies according to the obesity or the reverse of the patient, but as a rule strips two inches wide are used. One of these is measured around the patient and cut of a length to reach from a point one inch beyond the mid-sternal line to a point one inch beyond the mid-spinal line. The other strips are cut the same length, about twelve pieces being necessary.

The fractures are usually about the mid-axillary line or slightly in front of this line, and generally involve one or two ribs from the fifth to the ninth. The first strip of plaster is applied parallel to the ribs, *i. e.* from in front backward and upward, but is placed well below the point of fracture, in some cases nearly as low as the crest of the ilium (Fig. 1). The front end is attached first, and then while making considerable tension upon the strip, it is carefully and smoothly applied upward and backward to a

point just beyond the spine. The second strip is attached in front at a point level with the nipple, and is passed downward and backward to a point in the lumbar region. The third strip follows the direction of the first, overlapping its upper half. The fourth overlaps the second, etc. The line of overlapping should fall directly over the seat of fracture. When completed, the chest should be strapped from a point slightly above the ilium to a point well into the axilla (Fig. 2).

A four inch gauze bandage is now evenly applied over the entire chest and abdomen. This makes a soft lining for the starch jacket which is next applied. Crinoline used for starch bandages is of different qualities, and it is not always the most expensive crinoline which is the best for the surgeon's purpose. The most suitable quality is saturated with starch, and when moistened feels almost like liquid glue. It should be made into bandages four or five inches wide, not rolled too tightly. These bandages should be immersed in tepid water a few moments, but should not be squeezed much, as this wastes the starch. They are then applied over the gauze bandages, and like them form a jacket over the entire chest and abdomen. The crinoline should not be applied with much tension as it shrinks in drying, and may prove too tight. If the crinoline is of proper quality each layer will agglutinate itself to the one underneath, and the edges of the bandage will not curl up. Two safety pins in the end of the bandage are all that is necessary.

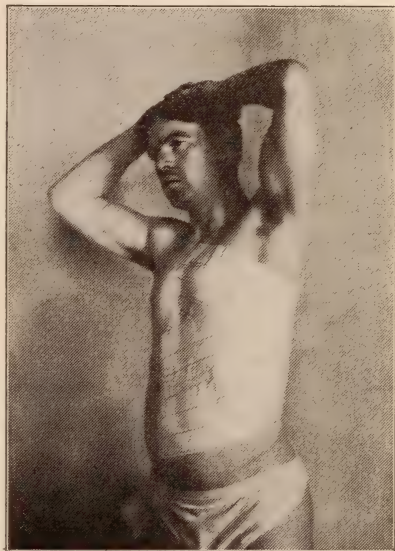


Fig. 2. The Chest Strapped Complete.

To hold the jacket in its original position, I now make sus-

penders by passing a three inch muslin bandage over each shoulder, the ends meeting low down in front and behind. These are attached to the starch jacket by a series of safety pins (Fig. 3). The patient is now placed upon his back in bed until the jacket dries,

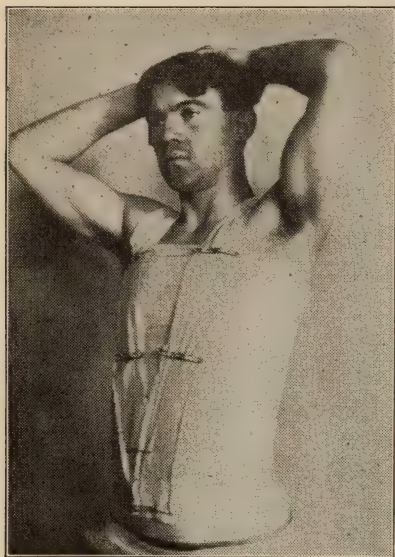


Fig. 3. The Starch Jacket with Shoulder Suspenders.

when it will be found straight and smooth, and in this condition it will remain indefinitely. The jacket is not heavy or uncomfortable, and immediately upon its application the patient feels a sense of security in taking a long breath without the fear of the sharp pain which he had before.

I have in some cases removed the dressing in three weeks, but consider four weeks a safer period, and if the patient is old or the fracture complicated, the time should be lengthened accordingly. Upon removing the plaster the skin should be sponged with ether, and if

there are any spots where the skin has been irritated by the plaster, lead and opium wash will be found a very soothing and effective dressing.

THE CARE OF TEETH AMONG SOLDIERS.

MEN who are fit for military service and have prepared themselves for dentists, or who are already dentists, says Captain B. Arentz (*Norsk tidsskrift for militær medicin*), are enlisted in the sanitary corps and perform their military service with it. During war they are to be utilized at field hospitals and on the line of communication. In combatant divisions they should give the men instruction in the care of teeth.—
HANS DAAE.

AN EMERGENCY CASE FOR FIELD SERVICE.

BY LIEUTENANT COLONEL LEONARD BALLOU ALMY,
MEDICAL DIRECTOR, RETIRED, IN THE CONNECTICUT NATIONAL
GUARD; MAJOR AND CHIEF SURGEON OF
UNITED STATES VOLUNTEERS.

YOU will kindly bear in mind that the little contrivance to which I would like to call your attention is an emergency case, not to be used under ordinary conditions, but on those occasions when the surgeon finds himself, as most of us have done, without other instruments or medicines than those which he has on his own person. Of course we know that according to regulations a medical officer is accompanied by a mounted orderly, who is equipped with the "orderly's pouch," the contents of which are familiar to all of you. Many of you have found that, as Mulvaney says: "There are many things happen in the field which are not in field orders" and sometimes orderlies are not just where they are supposed to be. Under such circumstances this little case is intended for use, when like the Mississippian's revolver "you want it right bad," then it is well to have it where revolvers are usually carried,—on the belt.

Last year we listened to an interesting description of a case of medicines to be carried by the medical officer in his vest pocket. That might work very well when he has a vest pocket, but in tropical service we most of us have found that waistcoats and often blouses are put in some more or less convenient place and a blue shirt and a pair of breeches constitute the major portion of our uniform.

One thing we are seldom without and that is a belt of some kind, and if we have a small case on that belt we are ready for an emergency. Some years ago, when few of us expected to see actual war, I happened to see in a gun shop, a pistol cartridge box, which it seemed might be used for the emergency case I

had had in mind. It cost fifty cents, and a loop to hold a hypodermic syringe was put on at a trifling expense. The bottles



Emergency Case for Field Service, Open.

came at one time or another with samples in them. The only other expense was the syringe, which may be any one of the kind where the needle goes in the piston.

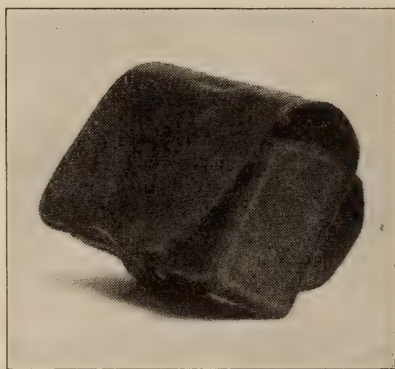
The contents of the case of course can be varied to suit the ideas of the owner; this contains :

1. Morphia and Atropia solution.
2. Strychnine Sulph., ten minims being equal to one thirtieth of a grain.
3. Tablet Nitro-glycerine, each one one-hundredth of a grain.
4. Solution Adrenalin, one to one thousand.
5. Solution Cocaine, four per cent.

Perhaps it is because I have used solutions so many years and my patients have been remarkably free from subsequent abscesses, that I prefer to have my medicines for hypodermic use in that form, made up as Bartholow advised, with three grains of carbolic acid to the ounce. Using medicines in this solution you can graduate the dose to the condition of your patient, and it is unnecessary to sterilize the water used, which is very often difficult and sometimes impossible.

However, tablets can be carried just as well, if one prefers them, and the case will hold more in the same compass.

I trust I have made it clear that this is not intended to be used except in an emergency, when for some reason or other a



Emergency Case for Field Service, Closed.

medical officer is practically alone and finds one or more soldiers wounded and no one but himself at call. This sometimes happens to Surgeons of the National Guard when ordered out for riot duty, or with our friends in the Philippines, where, if I am not misinformed, regulations are sometimes more honored in the breach than in the observance.

My remarks are not intended as in any way criticizing the present equipment of the medical department of the army, but merely to show an article of personal equipment which has been found very convenient for myself, and I know that some men have been saved a certain amount of suffering and shock because the medical officer present had a small case of medicine on his belt.

DISCUSSION.

Dr. WILLIAM T. THACKERAY, Ex-U. S. A.—I hold in my hand an object lesson apropos to this paper. I have carried this case for over ten years and everything in it is over ten years old. It has been across the Atlantic, across the Gulf of Mexico, and on mule back and across the Caribbean sea, across Panama, up the Pacific coast to Portland and down to San Francisco, and has crossed the continent of the United States four or five times. I have proved its efficiency within the last two or three weeks.

TROPICAL NEURASTHENIA.

NEURASTHENIA is described as he observed it in Porto Rico by W. W. King (*Journal A. M. A.*) using the term tropical rather to indicate local influences, than as signifying a particular type of the disorder. Comparatively few individuals, he thinks, escape certain symptoms of nervous exhaustion if they live in the tropics for a long period. Women are greater sufferers than men. While climate does have a certain relaxing effect, he thinks its influence is overestimated and that much should be attributed to the monotony of life, to the defective diet and to the habit of individuals. The variety of symptoms is as great as elsewhere, but he has noticed a lack of energy, a tendency to hypochondria and digestive disorders, loss of weight, disturbed sleep and dull occipital headache as prominent features. The symptoms may disappear gradually.

A NEW FIRST AID PACKET,

By WILLIAM M. ANGNEY M.D.,

FORMERLY ASSISTANT SURGEON IN THE NATIONAL GUARD
OF PENNSYLVANIA; SURGEON TO THE BUREAU OF
POLICE AND FIRE IN PHILADELPHIA.

THE problem of a first aid dressing that can be satisfactorily and safely applied to an emergency patient who has been injured in a great city, is not unlike the question of the first aid dressing on a battlefield.

In Philadelphia most of the injured are conveyed by patrol wagons to the nearest hospital. An opportunity is presented to the men on that wagon to use a dressing that will prevent infection of the wound.

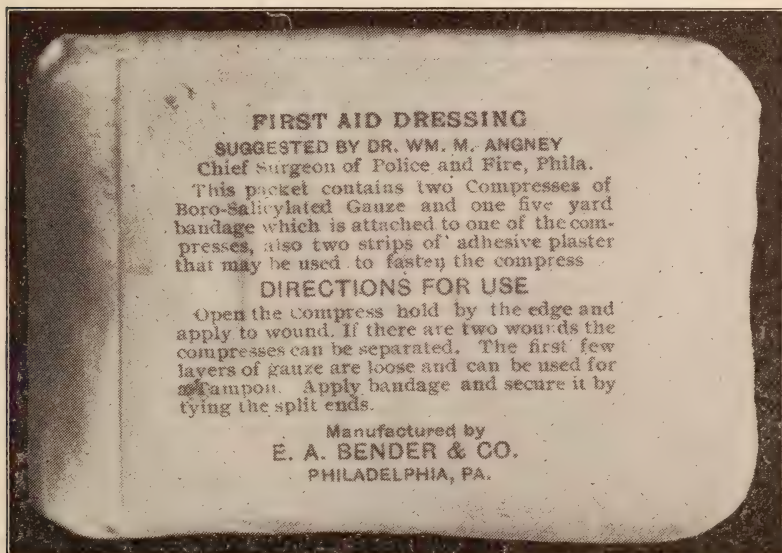
Philadelphia has thirty-two patrol wagons, the crews of which consist of a sergeant, patrolman and driver. Patrol wagons are summoned by a police officer to the aid of the injured by means of patrol boxes located throughout the city, but patrol wagons are frequently summoned to the aid of injured persons by means of the telephone message from citizens to the Police Headquarters. The wagons are supplied with a medicine chest containing a few simple remedies, bandages, gauze, etc.

Acting under orders of Colonel Sheldon Potter, Director of Public Safety, the question of equipping these wagons was presented to me and as the result of considerable thought in the matter and much reading, I have come to the conclusion that a simple first aid dressing was a need and the simpler the dressing the better for all concerned.

I present to your Association a sample dressing that has been made up for me by a manufacturer which seems to me to be all that is needed for the first aid dressing of wounds.

The wagons that we have under our jurisdiction are placed generally in the center of a district, and it takes a comparatively short time for them to reach the injured person.

The hospital may be some distance away, hence a dressing that will keep dirt and filth out of the wounds is of service and at the same time the dressing may be a factor in hemostasis or stopping hemorrhage. Of course, it is impossible to allow nearly untrained men to take sterile gauze from an ordinary receptacle with unclean hands and then bandage a wound, without infecting the wound and the gauze left behind in the receptacle.



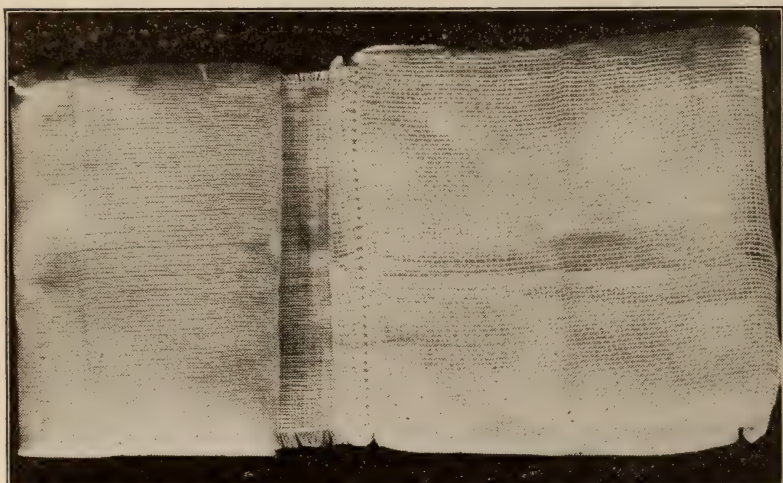
The Angney First Aid Packet.

I have been deeply impressed and much instructed by the able article on Battlefield Dressing by Colonel Nicholas Senn, which appeared some time ago in our JOURNAL.

It seems to me that some slight modification of Colonel Senn's dressing would come nearest the ideal. The dressing which I had adopted consists of two compresses, each three by three and one-half inches of gauze with absorbent cotton in the center; one is tacked permanently upon the bandage; the other is placed loosely on top of the first compress, and over-lying the second compress are a few layers of loose gauze which can be used by a physician for tamponage. The compresses are dusted with boro-salicylic acid. When one wound is present, the double pad can be placed upon it; if two are present or if the wound be a long one, then

the compresses can be separated and placed in position. There is sufficient bandage to wrap around the leg in its widest diameter or for use around the trunk.

The end of the bandage is split which is a satisfactory method of fixing it in position. Two strips of adhesive plaster are added, and I am not sure but that it would have been wiser to have left it out entirely. I discarded any method of attaching the adhesive plaster to the compress itself, thinking that in using the plaster, the fingers would probably soil the compress.



Contents of the Angney First Aid Packet.

The United States Army dressing consisting of a triangular bandage, two small compresses wrapped in oiled paper and an ordinary bandage with two safety pins, has been discarded as somewhat complicated and much more expensive. It weighs half an ounce more than the one I recommend and costs nearly twice as much.

Of course, this dressing will be so compressed that it will be less in bulk than the ordinary United States army dressing and if issued to patrolmen will be covered with a linen varnish or some other impervious material. We are now considering the question of supplying the 3,000 Police Officers of our city each with one of these dressings, and giving them some simple lessons in the use of this dressing. The Patrol Crews have already been instructed in sample emergency surgery.

A METHOD OF ARTIFICIAL FEEDING OF INFANTS IN THE TROPICS.

BY LIEUTENANT LEON T. LEWALD,

ASSISTANT SURGEON IN THE UNITED STATES ARMY; FORMERLY
INSTRUCTOR IN PATHOLOGY, NEW YORK UNIVERSITY.

THE many difficulties of providing a suitable artificial food for infants are well recognized in temperate climates. When confronted with the impossibility of securing fresh cow's milk in the tropics these difficulties at first thought appear almost insurmountable. Furthermore it appears that the percentage of infants needing artificial feeding is greater among the Americans in the tropics than in the United States. This is apparently owing to the debilitation of the American mother living in the tropics; though this may not be evident in her general health it does seem to render the natural food supply of the infant born in the tropics unsuitable for its proper nutrition.

It is not intended to imply that in all cases children do not thrive on natural feeding in the tropics as well as in the United States. And under no circumstances should the general rule of natural feeding be departed from so long as mother and child are doing well—the test for the child being a steady gain in weight. But on the other hand when it is found that the child or mother is not doing well, no time should be lost in making a change to artificial feeding; for very little or nothing can be done in the way of modifying the natural milk supply by changing the diet of the mother owing to the difficulty or impossibility of obtaining those very articles of diet which are useful in such cases. And furthermore the faulty nutrition of the child when once started takes on very rapidly a serious aspect. And likewise when depression of the mother's health first becomes evident little or no time should be lost in relieving her from this drain, as it is a well known fact in the tropics that while normal health may possibly

be maintained in certain individuals for a long period in the tropics, yet when nutrition once begins to fail and health drops below par, it either remains at this point or continues to decline and can be brought back to normal as a rule only by return to a temperate climate.

Having determined that a change from the mother's food is necessary, for the sake of either mother or child, what shall be the substitute? The first consideration is naturally the utilization of a wet-nurse. While at first thought this would seem to the uninitiated an easy solution on account of the numbers of native women with infant at breast seen everywhere, closer acquaintance with the conditions of life of the native woman shows the impossibility of realizing this hope. Firstly because the idea is repulsive to the child's family in the highest degree. Secondly the prevalence of venereal disease, tuberculosis, intestinal parasites—particularly infection with *uncinaria*, evidence of which has never been lacking in a limited number of natives examined personally. And thirdly the impossibility of entirely separating the native woman from her surroundings and family, so that she may not revert frequently to her natural mode of life, inasmuch as monetary inducements cannot move her to the foregoing of the habits of a lifetime. She has no desires to satisfy beyond her nipa shack, a handful of rice, a bit of dried fish, and a cigar or cigarette to smoke. It is barely possible that with long training and improved hygienic conditions of native life the future may see some of these obstacles eliminated, but at present the utilization of these native women seems impracticable.

This brings us to a consideration of a supply of fresh milk from any other source. Milch cows do not thrive or even survive residence in certain tropical countries, notably the Philippine Islands. The only other milk-giving animal available which does thrive in the tropics is the goat. Milk from this source does in a certain number of cases afford a working substitute for mother's milk. It sometimes necessitates a prolonged search for a suitable animal. When found the animal must be purchased, suitably housed, fed, and milked, under conditions best calculated to procure a pure and constant supply. These

conditions are fulfilled with great difficulty by the new resident in the tropics.

We are then practically forced to a consideration of the use of cow's milk preserved in some way, no matter how prejudiced we may be to its use in temperate climates.

During a voyage to the tropics one may perhaps utilize fresh milk carefully refrigerated or sterilized. But on account of the bulk required and unreliability these methods are not adapted to any but short journeys. Our main reliance must be upon milk sterilized and preserved in tins. For our purpose the less the milk has been concentrated or modified the better. Probably the best type of this class to be found on the market is that preserved in Australia. This milk however cannot be everywhere obtained and when available comes as a rule in such large tins that it is likely to spoil before the contents of the opened tin have been used. Now however there may be universally obtained an unsweetened concentrated milk conveniently prepared in small tins in the United States. It is to the question of how to properly modify this milk so as to bring it as near as possible to mother's milk or adjust it to the needs of the individual infant, and to change it from time to time to answer the need of the growing child that attention is directed in this paper.

TABLE SHOWING METHOD OF MODIFYING
EVAPORATED MILK.

Age. Beginning of	Milk. c. c.	Cane- sugar. grams.	Salt. gms.	Steril- ized Water. c. c.	Feed every	Hours of feeding.		Total number of feed'gs.
						A. M.	P. M.	
1st Week	3.	1.	.065	27.	2 hrs.	3 to 11		11
2nd Week	6.	1.	.065	39.	2 hrs.	5 to 11		10
4th Week	12.	1.	.065	56.	2 hrs.	5 to 11		10
2nd Month	20.	1.5	.065	85.	2.5 hrs.	5 to 10:30		8
3rd Month	30.	2.	.130	95.	2.5 hrs.	5 to 10:30		8
4th Month	35.	2.5	.130	100.	2.5 hrs.	5 to 10:30		8
5th Month	50.	2.5	.130	100.	2.5 hrs.	5 to 10:30		8
6th Month	60.	3.	.130	120.	2.5 hrs.	5 to 10:30		8
7th Month	70.	3.5	.130	140.	2.5 hrs.	5 to 10:30		8
8th Month	80.	4.	.130	160.	3 hrs.	5 to 11		7
9th Month	85.	4.5	.130	170.	3 hrs.	5 to 11		7
10th Month	90.	5.	.130	180.	3 hrs.	5 to 11		7
11th Month	110.	5.5	.130	220.	3 hrs.	6 to 9		6
12th Month	120.	6.	.130	240.	3 hrs.	6 to 9		6

Experience in starting infants at birth and feeding them on this diet; taking other infants from the breast at various months of age and placing them on this diet; and others from some form of feeding which did not nourish them properly, has resulted in a fairly constant method of modification of the milk sold in 500 gram tins at all military stations of our army in the Philippine Islands. This can be best shown in the form of the foregoing table, which may be used as a working basis.

The feedings are best prepared separately just at feeding time, but where ice is at hand a number of feedings may be prepared together at one time and turned into separate nursing-bottles which have been freshly sterilized by boiling. The bottles are then stoppered with sterilized cotton and placed on ice. It has been found advisable to have the druggist, each time the quantities of salt and sugar are changed, weigh out the exact amount of each and leave them with the person who is to modify the milk to serve as guides. This assures more accuracy than using the terms "a pinch of salt" or a "quarter of a spoonful of sugar." The use of milk-sugar has been found inadvisable in the tropics for to procure it freshly prepared is an impossibility. A number of samples examined have had a distinctly musty odor and taste.

The substitution of a certain amount of lime-water for an equal quantity of sterilized water in any of the above formulas may be made to good advantage in cases of indigestion, especially during the first few months. In case of constipation the substitution of oatmeal-water for an equal quantity of sterilized water works well. The oatmeal-water may be made as follows: to a pint of cool water add two tablespoonfuls of oatmeal and cook slowly for two hours. Then strain and let the water drip into a sterilized bottle. Cork, or better stopper with sterilized cotton, and place on ice. It should be made fresh every twenty-four hours. Use from thirty to sixty or more cubic centimeters in each feeding according to the effect upon the intestinal passages. Omit an equal quantity of sterile water from the feeding.

The substitution of barley-water for an equal quantity of sterilized water seems to be of advantage in cases in which there is a tendency to diarrhoea.

For example suppose a child in its second month with slight indigestion and diarrhoea. A suitable formula would be :

R		
	Unsweetened evaporated milk (cream).....	20. c. c.
	Cane sugar.....	15 grams
	Salt.....	.065 "
	Lime-water	15. c. c.
	Barley-water.....	35. "
	Sterilized-water.....	35. "

Directions: Feed at 5, 7:30, 10 A.M., and 12:30, 3, 5:30, and 8 P.M., and once later in the evening or during the night.

In case of acute illness it is a safe rule to use but one half the usual quantity of milk in any given formula. At times it may even be wise to withdraw the use of all milk for a few days, substituting some other form of nourishment, but a return to some one of the milk formulas (for instance that for a child a month or two younger, and then in a few days passing on to the correct formula) should take place as soon as practicable in order to prevent the child from losing weight: The fact that a loss in the weight of a child in the tropics can rarely be regained without a return to temperate climates, should never be lost sight of.

It is hoped that these formulas may serve as a working basis for providing an artificial food which a physician may with confidence prescribe on his debut in the tropics. It is to be noted however that the formulas are for average children and that at times a considerable departure may be necessary. For instance, an unusually large infant of say three months may to its advantage be placed on the formula for the average child of four months. The main guide must be a steady gain in weight.

PERSONAL EXPERIENCE WITH SPINAL ANALGESIA, AND ITS APPLICATION TO MILITARY SURGERY.

BY CAPTAIN HENRY D. THOMASON,

ASSISTANT SURGEON IN THE UNITED STATES ARMY; LATE
MAJOR AND BRIGADE SURGEON OF UNITED STATES
VOLUNTEERS.

THE following report of personal experience with spinal analgesia and its application to military surgery, is essentially in substance, a report recently submitted to the Surgeon General of the Army, and it is through his permission that the paper is presented at this meeting of the Association of Military Surgeons.

The cases reported are all those that have come under the personal observation of the writer since May 2, 1904 (the date of his first experience) to the present. All have been observed and operations performed in connection with Dr. C. E. Yount of Prescott, Arizona, to whom credit is due for original suggestion and practice in technique.

The subjects were operated upon in the Post Hospital, Whipple Barracks, Arizona; in the Hospital of the Sisters of Mercy; and in the Yavapai County Hospital, Prescott, Arizona, and in private homes of the city of Prescott.

CASE I.—P. B. white; male; aet 59; occupation miner. Diagnosis urethral fistula membranous portion, result of urethral stricture. Tropacocaine .32 mg. spinal injection 3d and 4th lumbar interspace. Analgesia complete in ten minutes. Operation external urethrotomy May 2d, 1904, lasting one hour and ten minutes absolutely painless. This was performed in the County Hospital, which at that time possessed but primitive operative equipment. Patient held basins, trays etc., and talked and laughed during procedure.

CASE II.—W. W. white; male; aet 52; occupation miner. Diagnosis carcinoma maxillary glands secondary to carcinoma lip. Operation August 15th, 1904. Tropacocaine spinal injection 2d and 3d lumbar interspace. .32 mg. Analgesia complete from umbilicus to toes in ten minutes, but only partial at seat of operation. Operation postponed. Severe headache fol-

lowed. The tropacocaine had been subjected to excessive heat in its sterilization.

CASE III.—Same individual twenty-four hours later. Same injection as day previous. Analgesia complete and prompt from diaphragm to toes, but only partial at seat of operation. Operation performed under chloroform. Slight headache followed. Tropacocaine had been subjected to excessive heat under sterilization.

CASE IV.—J. M. white; male; aet 45; occupation miner. Diagnosis necrosis right inferior maxillary. Operation August 29th, 1904. Tropacocaine .48 mg. spinal injection 2d and 3d lumbar interspace. Analgesia prompt from border of lower ribs to toes; partial only over field of operation and chloroform was employed. Analgesia lasted one hour and fifteen minutes. No after effects.

CASE V.—T. C. white; male; aet 45; occupation miner; perineal urethral fistula; complete urethral stricture. Operation September 5th, 1904. External urethrotomy. Tropacocaine .64 mg. spinal injection 3d and 4th lumbar interspace. Analgesia complete in six minutes. Operation entirely painless, patient laughing and talking during performance. Complete analgesia lasted four and one half hours. No after effects.

CASE VI.—M. W. white; female; aet 23; occupation none. Diagnosis ingrowing nails both great toes. Operation September 19th, 1904. Tropacocaine spinal injection .48 mg. 3d and 4th lumbar interspace. Powder as in former cases oversterilized (subjected to 232 degrees C. dry heat for thirty minutes). Analgesia complete above knees to umbilicus in twenty minutes. Operation forty minutes after injection with but slight pain. No after effects.

CASE VII.—E. T. Pvt. Co. "I" 29th Infantry. Aet 25. Diagnosis bubo left groin non-suppurative. Operation September 19th, 1904. Tropacocaine spinal .48mg. injection 3d and 4th lumbar interspace. Analgesia not complete in field of operation due to faulty technique in over sterilization of the powder. Excision of large gland without other anæsthetic or excessive complaint from patient. No after effects.

CASE VIII.—Same individual; operation for circumcision November 11th, 1904. Tropacocaine. 48 mg. spinal injection as before. Operation entirely painless. Analgesia complete from umbilicus to toes, lasting two hours. No headache, nausea, or other unpleasant effects.

CASE IX.—W. E. T. Pvt. Co. "I" 29th Infantry aet. 25. Operation January 7th, 1905. Amputation distal phalanx right index finger. Tropacocaine .64 mg. spinal injection 2d and 3d lumbar interspace. No appreciable effects in upper extremities, and according to patient's statements none in lower. Though the same mistake had been made in oversterilization of the tropacocaine, this patient was an individual totally lacking in fortitude or "nerve." The sight of instruments and preparation for operation had thrown him into violent hysterics before injection was given.

Pointing a needle at him to test analgesia produced loud complaints of pain without coming in contact with skin. It is uncertain in this case whether analgesia was present or not. Operation performed under chloroform.

CASE X.—N. N. S. Pvt. Co. "I" 29th Inf. aet. 29. Diagnosis external and internal hemorrhoids. Operation January 29th, 1905. Patient walked into operating room and prior to spinal injection fainted at sight of instruments and preparations for operation. Quick recovery. Ten minutes later tropacocaine .48 mg. spinal injection 3d and 4th lumbar interspace. Injection 11.50 A.M., operation 12 M. Forcible rectal dilatation, and removal hemorrhoids with clamp and cautery entirely painless. Analgesia lasted two hours. Complained of slight headache after. Returned to duty February 6th.

CASE XI.—P. T. Pvt. Troop "L" 5th Cav. aet 23. External hemorrhoids; operation Feby. 1st, 1905. Tropacocaine spinal injection .48 mg. 3d and 4th lumbar interspace 11 A.M. Operation 11.20. Forcible rectal dilatation, removal hemorrhoids with clamp and cautery; entire absence of pain. Patient conversed and laughed during performance. Analgesia complete from umbilicus to toes lasting two hours. Complained of slight headache for a few hours after. Duty Feby. 22d.

CASE XII.—A. W. K. Corp. Co. "I" 29th, Inf. aet 28. External hemorrhoids. Operation Feby. 8th, 1905. Tropacocaine .48 mg. spinal injection 3d and 4th lumbar interspace 11.37 A.M. losing about ten drops spinal fluid from the slipping of syringe. Operation 11.40. Forcible rectal dilatation, clamp and cautery, entirely painless; patient talked and laughed during performance. Analgesia lasted two hours and fifteen minutes. No after effects. Returned to duty Feby. 15th.

CASE XIII.—A. H. Mus. Co. "I" 29th Inf. aet 22. Operation Feby. 17th, 1905. Extensive growth of venereal warts on glans penis and foreskin. Tropacocaine .48 mg. spinal injection 3d and 4th lumbar interspace. Complained of slight nausea immediately, but passed off at once. Operation perfectly painless. Analgesia lasted two hours and twenty minutes. No after effects. Returned to duty Feby. 26th.

CASE XIV.—C. K. B. Pvt. Troop "L" 5th Cav. aet. 25. Feby. 21st sustained a compound fracture both bones right leg middle third, by fall from horse at Cossack drill. Tropacocaine .48 mg. spinal injection 3d and 4th lumbar interspace 11.30 A.M. Analgesia complete 11.50. Fracture reduced, dressed and placed in plaster cast with entire absence of pain. Analgesia lasted three hours. No after effects. Returned to Quarters for kitchen and police duty May 15th with excellent union.

CASE XV.—M. M. Pvt. Troop "L" 5th Cav. Exostosis 2 x 2 and $\frac{1}{2}$ inches. 3 inches above left femur anterior portion. Operation April 16th, 1905. Tropacocaine .48 mg. spinal injection 3d and 4th lumbar interspace. Analgesia appeared promptly and operation begun without pain, but lasted only ten minutes, and operation completed under chloroform. It subsequently developed that the tropacocaine used was from old tube that had

previously been subjected to excessive heat, and this is believed to have been the cause for its short analgesic action. No after effects.

CASE XVI.—J. W. L. Pvt. Troop "L" 5th Cav. aet 22. Rectal fissure and ulceration rectum and anus. Operation May 24th, 1905 in the presence of Colonel Edward B. Moseley, Chief Surgeon of the Department. Tropacocaine .48 mg. spinal injection 3d and 4th lumbar interspace at 10.02 A.M. Operation 10.10, forcible rectal dilatation, cauterization fissure and ulcers, entirely painless. Analgesia in this instance extended over entire body; needle inserted through cheek or scalp without pain, and operation could have been performed on any part of body. Analgesia lasted three hours. No after effects.



Fig. 1. Case XXXII. Spinal Analgesia.

Producing local anaesthesia over point of puncture with ethyl chloride spray. Showing also position of patient for insertion of needle when too ill to sit up.

CASE XVII.—H. H. white; male; aet. 22. Diagnosis psoas abscess, tubercular, pointing just below apex Scarpa's triangle right thigh. Patient suffering from advanced pulmonary involvement. General anaesthesia out of the question. Tropacocaine .48 mg. spinal injection 3d and 4th lumbar interspace. Operation 20 minutes later. Patient nervous and excitable and during operation complained of pain. Following day acknowledged it was painless and complaint was due to fright. No after effects.

CASE XVIII.—W. W. white; male; aet 47; laborer. Infected gland of neck; indurated and partly suppurative. Tropacocaine .80 mg. spinal in-

jection 2d and 3d lumbar interspace. Operation May 31st, 1905. Analgesia complete from umbilicus to toes. Partial in field of operation. No other anaesthetic required.

CASE XIX.—P. B., Mexican; laborer; aet 72. Marked debility, malnutrition, and emaciation. Diagnosis left indirect complete inguinal hernia. Administration of general anaesthesia unjustifiable. Tropacocaine .48 mg. spinal injection 3d and 4th lumbar interspace. Analgesia over seat of operation immediate. A Bassini operation for radical cure lasting half hour, without least pain. Operation June 2d, 1905. No after effects.

CASE XX.—T. G., white; male; miner; aet. 54. Diagnosis prostatic hypertrophy. Operation perineal prostatectomy June 2d, 1905. Tropacocaine .48 mg. spinal injection 3d and 4th lumbar interspace. Analgesia over seat of operation immediate. No pain from incision or decapsulation of gland, but complained of trifling discomfort from traction and pressure of hand in wound, and during extirpation. Patient talked and laughed during operation.

CASE XXI.—M. G., white; male; occupation, miner; aet. 43. Displaced astragalus right foot of several years standing, rendering foot practically useless. Operation June 2d, 1905. Tropacocaine .48 mg. spinal injection 3d and 4th lumbar interspace. Analgesia complete and immediate. Excision of astragalus and lower portion of tibia accomplished with entire absence of pain. Length of operation 15 minutes. No after effects.

CASE XXII.—S. M. E., general military prisoner; aet 23. Diagnosis external hemorrhoids. Operation June 3d, 1905. Tropacocaine .48 mg. spinal injection 3d and 4th lumbar interspace. Analgesia immediate. Forcible rectal dilatation, clamp and cautery; operation entirely painless. No after effects. Returned to duty June 10th.

CASE XXIII.—C. Y., white; female; wife of physician; aet 31. External and internal hemorrhoids. Operation June 12th, 1905. Tropacocaine spinal injection .48 mg. 3d and 4th lumbar interspace. Analgesia immediate from ribs to toes. Forcible rectal dilatation, clamp and cautery entirely painless. Analgesia lasted one hour and twenty minutes. No after effects.

CASE XXIV.—D. G., white; male; retired miner; aet. 62. Diagnosis empyema right cavity; patient very low condition; disease had existed seven years; dyspnoea marked; paracentesis had been performed; cyanosis present; heart's action weak labored and rapid; emaciation and cachexia marked; haemoglobin forty-five per cent. Employment of a general anaesthetic positively contraindicated. Operation June 15th, 1905. Tropacocaine .64 mg. spinal injection 2d and 3d lumbar interspace. In this instance unusual difficulty was experienced in entering canal, due to the spinal curvature incident to the empyema. Analgesia present over thorax in 15 minutes. Operation resection two inches right seventh rib. No pain experienced from incision or separation of thoracic muscles or detachment of periosteum, but when rib itself was excised patient complained of pain. Large

quantities of pus evacuated with immense relief. No unpleasant after effects.

CASE XXV.—J. S., white; male; occupation, miner; aet. 50. Diagnosis vesical calculus. Operation June 26th, 1905. Tropicocaine .64 mg. spinal injection 3d and 4th lumbar interspace. Analgesia immediate. Median perineal operation with entire absence of pain: patient talked and laughed and when told incision was being made remarked "you are joking." Large stone removed in fragments. Length of operation 20 minutes; analgesia lasted one hour. No after effects.

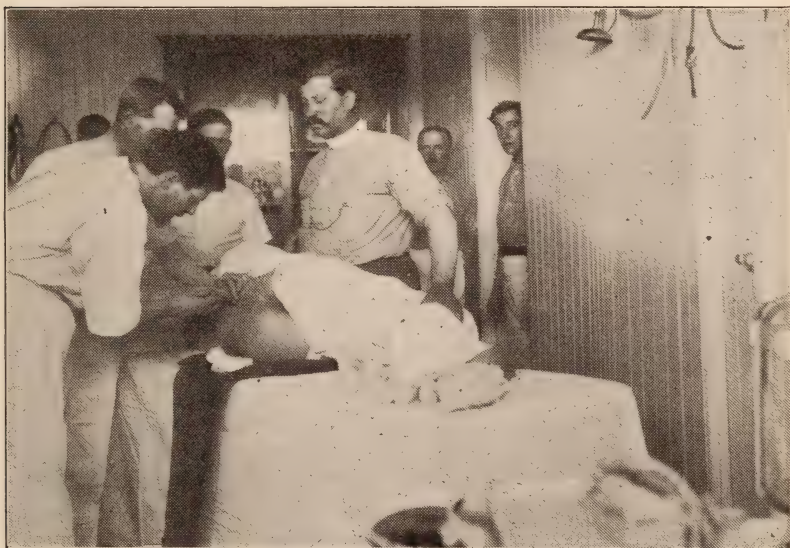


Fig. 2. Case XXXII. Spinal Analgesia.

Needle and syringe in position; and spinal fluid being drawn into barrel of syringe loaded with tropacocaine. This it readily dissolves. As soon as dissolved contents are forced into spinal canal.

CASE XXVI.—M. C. white; male; occupation, miner; aet. 45. Diagnosis necrosis of os calcis and tibia right ankle. Operation June 28th, 1905. Tropicocaine .64 mg. spinal injection 3d and 4th lumbar interspace. Analgesia immediate; removal of os calcis entire and resection lower portion of tibia, with through and through drainage of foot with absence of pain. Length of operation fifteen minutes. Analgesia one hour. No after effects.

CASE XXVII.—W. N., male; white; occupation druggist; aet. 65. Diagnosis prostatic hypertrophy, and complete urethral stricture. General condition of patient alarming and urgent, from prolonged uraemia; pulse and respiration rapid and weak; general anaesthesia out of the question; opera-

tion, perineal prostatectomy June 29th, 1905. Tropacocaine spinal injection .48 mg. 3d and 4th lumbar interspace. Analgesia immediate. Painless operation lasting 40 minutes. Analgesia two hours. No after effects.

CASE XXVIII.—C. B., white; male; occupation carpenter; aet. 43. Compound comminuted fracture both bones left leg received by being forcibly blown off stand 8 feet in height by premature explosion of fireworks, and thrown 50 feet, July 4th, 1905. Fracture tibia two inches below knee right side; compound fracture same three inches above ankle; fracture fibula at middle. Tropacocaine .48 mg. spinal injection 3d and 4th lumbar interspace. Analgesia immediate; fractures reduced, dressed, and plaster cast applied with entire absence of pain or suffering. Analgesia lasted two and one-half hours. No after effects.

CASE XXIX.—M., white; female; aet. 32; occupation housewife. Diagnosis retained secundines following incomplete abortion of a few days previous. Pain and tenderness severe left iliac region, causing patient continuous suffering; temp. 104; pulse 110. July 21st, 1905, tropacocaine .48 mg. spinal injection 3d and 4th lumbar interspace. Relief of pain immediate; complete analgesia prompt; relaxation of genitalia most satisfactory. Operation instrumental and digital curettage, with entire absence of pain. No after effects. Recovery prompt.

CASE XXX.—P. male; white; occupation carpenter; aet. 45. Diagnosis osteomyelitis following typhoid fever, right tibia. August 5th, 1905 tropacocaine .48 mg. spinal injection 3d and 4th lumbar interspace. Analgesia complete lower extremities. Operation lasted 15 minutes, analgesia one hour. No after effects.

CASE XXXI.—G. V., white; female; occupation housewife; aet. 28, pregnant multipara. August 20th 1905 at full term premature rupture of waters. Pain severe; patient hysterical; pains continued violent, and progress of labor slow; patient begged and pleaded for relief; chloroform short of complete anaesthesia ineffectual. At 2.25 A.M. Aug. 21st, 1905 tropacocaine .32 mg. spinal injection 3d and 4th lumbar interspace. Pains entirely absent five minutes later, but uterine contractions continued without interruption. Painless birth at 2.47 A.M. mother smiling as head pressed upon and passed over perineum. Crede's method failed to deliver placenta; accomplished by introduction of hand into uterus with entire absence of pain. Prompt uterine contraction and no ill after effects.

CASE XXXII.—E. O., Pvt. Troop "L" 5th Cav. aet. 22. In the first week of an attack of typhoid this soldier exhibited marked abdominal symptoms suggestive of intestinal perforation; tympanites, muscular rigidity, rapid and weak pulse, etc. Exploratory abdominal operation Aug. 20th, 1905. Tropacocaine .64 mg. spinal injection 3d and 4th lumbar interspace. As pain was most marked over McBurney's point and as large per cent of perforation in typhoid occur within twelve inches of caecum incision was the usual one for an appendectomy. Incision was painless. The peritoneum inflamed and

when opened there were evidences of acute peritonitis. No perforation but appendix showed inflammatory involvement. Appendectomy performed. No appreciable pain until traction with rat-tooth forceps made upon inflamed and adherent peritoneum in the act of suturing. A few breaths of chloroform, not to exceed twenty respirations, tided over the closure of the peritoneum without pain, and the muscular and integumentary tissues were closed under the original analgesia entirely free from pain (see illustrations). Patient at this writing (Sept. 9th, 1905) just beginning the convalescent stage from typhoid. Abdominal pain and discomfort entirely ceased after operation. Union by



Fig. 3. Case XXXII. Spinal Analgesia. An appendectomy.
The initial incision.

first intention. Patient passed through an ordinarily severe case of typhoid fever.

CASE XXXIII.—C. K., Pvt. Co. "I" 29th Inf. aet. 22. Diagnosis extensive prolapsus recti. Operation August 31st. Tropacocaine spinal injection, 3d and 4th lumbar interspace. Analgesia immediate. Operation per cautery scarification prior to reduction, and subsequently, with entire absence of pain (see illustration). At this writing Sept. 9th, 1905 rectum has retained normal place. No after effects.

CASE XXXIV.—W., white; female; aet. 24; wife of an officer. Diagnosis chronic metritis. Tropacocaine spinal injection 3d and 4th lumbar in

terspace .48 mg. Analgesia immediate. Operation uterine curettage Sept. 1st, 1905. Entirely painless. No after effects.

CASE XXXV.—F. H., white; male; aet. 25. Occupation stone cutter; third week of typhoid fever developed indications of intestinal perforation. Onset of intestinal symptoms sudden. Condition serious. At 2 A.M. Sept. 2nd, 1905, tropacocaine spinal injection .64 mg. 3d and 4th lumbar interspace. Analgesia complete by time field of operation was prepared. Painless incision over McBurney's point. Evidences of purulent peritonitis. Perforation four inches above caecum. Operation lasted twenty minutes, and though patient was entirely conscious, was accomplished without pain. Patient died at 9 A.M. Sept. 2d, 1905. Some improvement following operation, but at 8 A.M. collapse occurred.

CASE XXXVI.—Q. R., Mexican; aet 24; laborer. Diagnosis umbilical hernia. Complicated with mild ascites; latter suspected to be of tubercular origin as patient gave history of evening rises in temperature. General nutrition and condition good, patient complaining only of inconvenience from hernia. Operation September 19th, 1905. Tropacocaine spinal injection .64 mg. 2d and 3th lumbar interspace. Analgesia complete at seat of operation by time field was prepared. A modified Mayo operation for umbilical hernia performed. During its progress considerable abdominal fluid escaped of serous nature, and the peritoneum found to be the seat of numerous tubercular nodules; for this reason drainage established lower in abdomen. Operation entirely painless. Patient asked for a cigarette during its performance. Duration of operation thirty minutes; of analgesia two hours. No after effects.

CASE XXXVII.—Mrs. R., white; aet. 25. Sept. 12th, 1905. Diagnosis pelvic peritonitis. Pyosalpinx (left.) Tropacocaine .48 mg. spinal injection 3d and 4th lumbar interspace. Analgesia prompt and lasting two hours and forty-five minutes. Operation vaginal puncture and drainage of abscess. Slight pain noticed only when peritoneum was pushed or pulled upon. No unpleasant after effects.

CASE XXXVIII.—Mrs. A. O., Mexican; aet 33. Sept. 25th, 1905. Diagnosis retained secundines. Sappremia. Tropacocaine .48 mg. spinal injection 3d and 4th lumbar interspace. Analgesia in lower extremities prompt, and in field of operation soon after. Patient had been begging for chloroform because of severe pain and suffering. Operation dilatation of os and curettage of interior of uterus. Absolutely painless. Trivial headache day following.

CASE XXXIX.—E. L. J., white; male; aet. 26; clerk. Sept. 26th, 1905. Diagnosis ischio-rectal abscess complicating advanced pulmonary tuberculosis. Tropacocaine .32 mg. spinal injection 3d and 4th lumbar interspace. Analgesia at field of operation immediate. Operation—incision, exploration, drainage. Absolutely painless. Slight headache soon after operation, Worse on day following, but free from same if head was kept upon pillow.

CASE XL.—Mrs. J. D., white; aet. 44. Oct. 11th, 1905. Diagnosis retained secundiness; sapremia. Tropacocaine .32 mg. spinal injection 3d and 4th lumbar interspace. Operation dilatation os and curettage uterus. Complained of slight pain when uterus was pulled upon at time of forcible dilatation. Otherwise painless. No after effects.

CASE XLI.—G., white; male; aet. 72. Oct. 11th, 1905. Diagnosis osteomyelitis left fibula. Tropacocaine spinal injection .48 mg. 3d and 4th lumbar interspace. Lost all of fluid with dissolved tropacocaine at time of first injection through leakage at cup of needle. Repeated dose and had immediate analgesia. Operation excision of six inches fibula, upper por-



Fig. 4. Case XXXII. Spinal Analgesia. An appendectomy. Appendix drawn through wound.

tion and drainage lower leg to tendo achilles. No pain experienced until closing wound with sutures when analgesia was wearing off. No after effects.

CASE XLII.—B. M. E., Sergeant Troop "L" 5th Cav.; aet. 27. Oct. 21, 1905. Diagnosis phimosis. Tropacocaine spinal injection .48 mg. 3d and 4th lumbar interspace. Analgesia prompt. Operation circumcision and section of frenum absolutely painless. Analgesia lasted two hours and fifty minutes. No after effects

CASE XLIII.—C. K., Pvt. Co. "I" 29 Inf., aet. 22. Oct. 26th, 1905. Diagnosis prolapsus recti. Tropacocaine spinal injection .48 mg. 3d and 4th

lumbar interspace. Analgesia prompt. Operation correction of prolapsus by Verneuil's method. Length of operation one hour. Entirely painless except when rectum was strongly tracted patient complained of a dragging sensation "in the stomach." Length of analgesia two hours. No after effects.

CASE XLIV.—C. B. St. C. Pvt. Co. "I" 29th Inf.; aet 21. Oct. 29, 1905. Diagnosis ischio-rectal abscess, and communication sinuses. Tropacocaine .48 mg. spinal injection 3d and 4th lumbar interspace. Analgesia prompt. Operation incision, exploration, laying open three communicating sinuses, drainage. Absolutely painless. Operation required ten minutes. Length of analgesia one hour and fifty minutes. No after effects.

CASE XLV.—J. B., white, male; aet. 70, miner. November 2d, 1905. Diagnosis fracture neck of femur. Tropacocaine .64 mg. 3d and 4th lumbar interspace spinal injection. Unusual difficulty experienced in entering subarachnoid space due to posture and nature of injury. Operation "setting" and splinting limb. Absolutely painless. No after effects.

CASE XLVI.—M. L., colored; porter; aet. 22. Nov. 7th, 1905. Diagnosis ischio-rectal abscess. Tropacocaine .48 mg. spinal injection 3d and 4th lumbar interspace. Analgesia immediate. Operation, incision, irrigation, curettage, drainage. Entirely painless. No after effects.

CASE XLVII.—G. T., white; male; aet 20; clerk. Nov. 11th, 1905. Diagnosis phimosis. Tropacocaine .32 mg. spinal injection 3d and 4th lumbar interspace. Analgesia immediate. Operation circumcision. Entirely painless. Decided and peculiar headache for five days but did not keep patient from his work.

CASE XLVIII.—A. M., white; male; aet. 32; miner. Nov. 15th, 1905. Diagnosis phimosis. Tropacocaine .32 mg. spinal injection 3d and 4th lumbar interspace. Analgesia immediate. Operation of circumcision entirely painless. No after effects.

CASE XLIX.—Pvt. C. K. Same individual and same operation as described as in Case XLIII. Same results.

CASE L.—Mrs. Y., white, aet. 31. Wife of physician. Dec. 7th, 1905. Diagnosis primipara in 2d stage of labor with marked dystocia. Tropacocaine .48 mg. spinal injection 3d and 4th lumbar interspace. Most of solution lost through leakage at cup of needle due to manipulation in faulty light. Despite this analgesia was prompt, and gave absolute freedom from all pain for twenty minutes, but chloroform was employed for forceps as same had not been sterilized at time puncture was made and analgesia existed.

CASE LI.—P. K., pvt. Troop "L" 5th Cav. aet. 28. Dec. 12th, 1905. Diagnosis necrosis styloid process and head of right ulna. Tropacocaine spinal injection .64 mg. 2d and 3rd lumbar interspace. Operation removal by bone forceps and curette of necrosed tissue. Pain insignificant during operation, and entirely absent at completion thereof. Analgesia lasted in upper extremities one hour and forty minutes. Could pass needle through

integument of neck and cheek without pain. Complained of headache and dizziness for one week after operation.

CASE LII.—Same individual and operation and results as described in case XLIV. At this time the fistula was discovered to be tubercular, and there was also pulmonary infection. Case transferred to Fort Bayard. Operation Dec. 19th, 1905.

CASE LIII.—J. B., white; male; stonecutter; aet. 25. Dec. 23d, 1905. Diagnosis urethral stricture middle spongy portion, 22 sound could not be passed. Gonorrhea two years previous, and history of gleet last 18 months. Tropacocaine .48 mg. spinal injection 3d and 4th lumbar interspace. In this



Fig. 5. Case XXXII. Spinal Analgesia. An appendectomy.
Closing the wound. Insertion of skin sutures.

instance a blood vessel was punctured, and the spinal fluid was mixed with blood so that it was uncertain to the mind of the writer if the interarachnoid space had been entered. Assuming from the sensation communicated to the fingers that the space was entered, patient was prepared for operation. Operation forcible dilatation to the size of a 32 sound with entire absence of pain. No after effects.

CASE LIV.—M. G., aet. 27; Pvt. Troop "L" 5th Cav. Dec. 27, 1905. Diagnosis ingrowing nails both great toes. Tropacocaine .48 mg. spinal injection. 3d and 4th lumbar interspace. Operation removal two edges both nails. Absolutely painless, No after effects.

CASE LV.—J. D., white; male; aet. 43, Dec. 27th, 1905. Diagnosis recto-perineo-scrotal fistula. Tropicocaine .64 mg. spinal injection 3d and 4th lumbar interspace. Analgesia immediate. Operation excision and curettage fistulous tract. Entirely painless. No after effects.

CASE LVI.—Same individual and same results described in cases XLIII and XLIX. In this instance operation was extensive cauterization of prolapsed rectum. Entirely painless. No after effects.

CASE LVII.—A. S., Pvt. Co. "I" 29th Inf.; Hebrew; aet. 27; Jany. 17th, 1906. Diagnosis ischio-rectal abscess. Tropicocaine .64 mg. spinal injection 3d and 4th lumbar interspace. Analgesia immediate. Operation incision, opening and incising fistulous tract into rectum, laying open through sphincters, cleaning tract with scissors, curetting tract and abscess cavity, and closure. Absolutely painless. Analgesia lasted two hours and forty minutes. Upon disappearance of analgesia and presence of post-operative pain, patient complained most bitterly, became hysterical, and showed palor and weakened pulse. This lasted one hour. No other after effects.

CASE LVIII.—J. B. E., Corp. Troop "L" 5th Cav. aet. 22. Jany. 22, 1906. Diagnosis cysto-lipoma left testicle and cord, result of gonorrhoeal orchitis. Tropicocaine .32 mg. spinal injection 3d and 4th lumbar interspace. Only partial analgesia secured. Upon investigation preparation was found to have been old. Repetition of injection with like amount of fresh tropacocaine gave prompt analgesia. Excision of growth accomplished with entire absence of pain. No after effects.

CASE LIX.—J. A., Pvt. Troop "L" 5th Cav. aet. 22. Jany. 25th, 1906. Diagnosis stricture urethra distal portion. Tropicocaine .48 mg. spinal injection 3d and 4th lumbar interspace. Analgesia prompt. Operation forcible dilatation with sounds. Entire absence of pain. No after effects.

CASE LX.—C. B., Civilian Q. M. employee; aet. 23. Feby. 6th, 1906. Diagnosis hemorrhoids external and internal. Tropicocaine .48 mg. spinal injection 3d and 4th lumbar interspace. Analgesia prompt. Operation removal of growths by clamp and cautery. Entirely painless. No after effects.

CASE LXI.—E. M. I. Pvt. Co. "I" 29th Inf.; aet. 22. Feby. 7th, 1906. Diagnosis hemorrhoids external and internal extensive. Tropicocaine .48 mg. spinal injection 3d and 4th lumbar interspace. Analgesia prompt. Operation removal hemorrhoids by clamp and cautery. Entire absence of pain. No after effects except had to be catheterized for three days following operation due to spasm of sphincter of bladder. This is believed to have been due to extensive operation and not to the use of tropacocaine.

CASE LXII.—Y., white; male; aet. 33; butcher; Feby. 7th, 1906. Diagnosis lipoma size of two hen eggs left gluteal region. Tropicocaine .64 mg. spinal injection 3d and 4th lumbar interspace. Analgesia prompt. Operation incision (growth found to be partially broken down) enucleation and curettage. Absolutely painless. Patient continued to attend to his work

and when doing so complained of slight headache for five days. When lying down headache would entirely disappear.

CASE LXIII.—J. C., white; aet. 43; miner; Feby. 14th, 1906. Diagnosis recto-perineal fistula long standing and extensive. Tropicocaine .48 mg. spinal injection 3d and 4th lumbar interspace. Analgesia prompt. Operation performed by Prof. Murphy of Los Angeles; injection made by the writer. Operation entirely painless. No after effects.

CASE LXIV.—M. civilian Q. M. employee; aet. 30. Feby. 15th, 1906. Diagnosis chronic and persistent constipation. Tropicocaine .48 mg. spinal injection 3d and 4th lumbar interspace. Analgesia immediate. Forcible recta-



Fig. 6. Case XXXIII. Spinal Analgesia.

Locating point of puncture. Imaginary line between iliac crests (superior) passing through third and fourth lumbar interspace.

dilatation with entire absence of pain. No after effects.

CASE LXV.—R. H., aet. 29; Sergt. Co. "I" 29th Inf. Feby. 15th, 1906. Diagnosis ingrowing toe nail right great toe with suppuration of matrix and surrounding tissue. Tropicocaine .64 mg. spinal injection 3d and 4th lumbar interspace. Analgesia of feet in five minutes. Operation removal of inner half of toe nail. Painless. No after effects.

CASE LXVI.—G. D., white; male; miner aet. 46. Feby. 21st, 1906. Diagnosis osteo-myelitis right fibula and three tarsal bones, Tropicocaine .48 mg. spinal injection 3d and 4th lumbar interspace. Analgesia prompt. Opera-

tion incision removal necrotic tissue, drainage. Analgesia lasted one hour. Operation painless. No after effects.

CASE LXVII.—M. S., white; female; aet 32. Feby. 27th, 1906. Diagnosis labial abscess. Tropacocaine .48 mg. spinal injection 3d and 4th lumbar interspace lasting one hour. Operation incision and removal abscess wall; absolutely painless. Slight headache in less than an hour, and this continued with great severity for two weeks, and was little influenced by drugs including morphine. There was also pain in neck muscles. Temperature and pulse normal throughout. Headache absent so long as absolute quiet in recumbent posture was maintained, but simply raising the head bring would it on during first five days. No "break" in technique known in this case except patient was permitted to walk home after operation.

CASE LXVIII.—L. female; aet. 28; white; March 12, 1906. Ten weeks previously had given birth to large child; first confinement. Diagnosis extensive laceration of cervix and perineum. Tropacocaine spinal injection .64 mg. 3d and 4th lumbar interspace. Analgesia prompt. Operation curettage of uterus, trachelorrhaphy, and perineorrhaphy, entirely painless except when strong traction was made upon uterus with volsellum forceps complained of unpleasant (not painful) dragging sensation. Operation required one half hour. Length of analgesia two hours. No after effects.

CASE LXIX.—Mrs. J., white; aet. 27. March 16th, 1906. Diagnosis in labor 3d confinement. Labor nearing end of first stage. Pains frequent and strong. Tropacocaine .32/mg. spinal injection 3d and 4th lumbar interspace. Pains of uterine contractions while not entirely obliterated were very much modified, and the perineum, rectum and external genitals were entirely analgetic. At the termination of 2d stage of labor there was entire absence of painful sensation, and child was expelled painlessly. Placenta removed without pain. The spinal injection did not in any way diminish the force or frequency of uterine contraction. Perhaps .48 mg. would have completely destroyed pain. Patient stated that the labor pains were very markedly easier in comparison with former confinements. No after effects.

CASE LXX.—A. S. Pvt. Co. "I" 29th Inf. aet. 27. March 23, 1906. Diagnosis external hemorrhoids. Tropacocaine spinal injection .32 mg. 3d and 4th lumbar interspace, Analgesia. Operation removal by ligature method. Entirely painless. No after effects.

CASE LXXI.—J. D., white; male; miner; aet. 72. March 27, 1906. Diagnosis—ruptured (into tissues) popliteal aneurism with beginning necrosis of femur. Tropacocaine .64 mg. spinal injection 3d and 4th lumbar interspace. Only 6 or 8 drops of the spinal fluid could be drawn into the syringe and the tropacocaine was dissolved with difficulty, but analgesia was prompt and lasted 45 minutes, Operation—incision and exploration of contents of sac and perianeurismal suppuration. As full diagnosis was only made after exploration, the treatment (amputation of thigh) was decided upon without proper instruments being at hand. Forty minutes were

required to secure and prepare these, and when ready the analgesia was insufficient. Because of the difficulties noted above, its administration was not repeated, but its action was all that could be desired while it lasted. Amputation under chloroform anæsthesia. No ill after effects and but small degree of shock.

CASE LXXII.—O. G. Pvt. Troop "L" 5th Cav. aet. 23. Diagnosis adenitis, acute, nonsuppurative, 3 glands right groin of venereal origin. Operation May 3d, 1906. Tropacocaine .46 mg. 3d and 4th lumbar interspace. Analgesia over field of operation in 3 minutes. Complete extirpation of in-



Fig. 7. Case XXXIII. Spinal Analgesia.

Anaesthetizing point of spinal puncture with ethyl chloride spray. Shows also most convenient position of patient for spinal puncture.

fected glands. Pain trifling and present only when strong traction was made in act of breaking up strong adhesions. No after effects.

CASE LXXIII—R. W. L. Squadron Sergeant Major 5th Cav. aet. 31. Diagnosis hemorrhoids external and internal. Operation May 22d, 1906. Tropacocaine spinal injection .48 mg. 3d and 4th lumbar interspace. Analgesia over field of operation prompt. Removal of hemorrhoids by clamp and cautery entirely painless. Remained in bed six days entirely free from headache or other unpleasant symptoms. Returned to duty May 29th 1906, and suffered for several days from headache.

CASE LXXIV.—A. D. Pvt. Co. "I" 29th Inf. aet. 38. Diagnosis hem-

orrhoids external extensive size of average fist. Operation June 4th, 1906. Tropacocaine .64 mg. spinal injection 3d and 4th lumbar interspace. Removal of growths by clamp, scissors and cautery. Entirely painless. No after effects.

CASE LXXV.—S. Z. Musician Co. "I" 29th Inf. aet 24. Diagnosis venereal warts glans penis. Operation June 24th, 1906. Tropacocaine .48 mg. spinal injection 3d and 4th lumbar interspace. Analgesia prompt. Removal by scissors entirely painless. No after effects.

CASE.—LXXVI.—M. female; white; aet 53. Diagnosis recto-perineal fistula six inches in length. Operation July 7th, 1906. Tropacocaine .64 mg. spinal injection 3d and 4th lumbar interspace. Analgesia prompt. Exposure of fistulous tract from point of origin through sphincter curettage and excision with scissors, and closure of tract with catgut sutures. Entirely painless. No after effects.

CASE LXXVII.—B. male; Italian; aet. 28. Diagnosis urethral stricture. Operation July 7th, 1906. Tropacocaine .48 mg. spinal injection 3d and 4th lumbar interspace. Analgesia prompt. Dilatation of stricture entirely painless. No after effects.

CASE LXXVIII.—W. B. male; carpenter. Diagnosis extensive exuberance of callus and deformity right tibia at juncture middle and lower third following compound comminuted fracture year previous. Operation July 22d, 1906. Tropacocaine .64 mg spinal injection 2d and 3d lumbar interspace (failed to secure puncture at 3d and 4th interspace, but readily accomplished it at 2d and 3d interspace). Analgesia prompt. Removal of exostosis and callus with chisel, mallet and bone forceps with entire absence of pain. No after effects.

CASE LXXIX.—Mrs. G. B. R. wife of officer, aet. 28. July 25th, 1906. Diagnosis primipara nearing end of first stage of labor. Pains severe. Tropacocaine .64 mg. spinal injection 3d and 4th lumbar interspace. Immediate and complete relief from all pain but no lessening in frequency and force of uterine contractions. Delivery by forceps entirely painless as well as suturing of extensive perineal laceration. No after effects.

As a result of experience in the foregoing cases the following remarks, comments, and conclusions are submitted.

The technique employed was closely modeled after that introduced by A. W. Morton, M.D., of San Francisco, California, and as practiced by him in approximately 3,000 cases, differing from his method however in minor detail, in preparation of powder and instruments.

The important and essential feature of this method is, *that the cerebro-spinal fluid serves as the solvent to the tropacocaine*; thereby reducing to a minimum the chances of infection, and

avoiding increased intracranial and spinal pressure, as frequently results from the common practice of preparing the solution external to the body, and by means of a foreign solvent; thus producing severe and prolonged headaches, nausea, and not infrequently other alarming toxic symptoms which have done much to bring spinal analgesia into disrepute and condemnation.

The experience of the writer demonstrates to his mind that perfect detail of preparation and technique is of *essential* import-



Fig. 8. Case XXXIII. Spinal Analgesia.

Needle having entered spinal canal, syringe loaded with tropacocaine is attached. Spinal fluid is drawn into the loaded barrel, and readily dissolves the tropacocaine. When solution is accomplished contents are forced into spinal canal.

ance; the most scrupulous observance of its requirements in minute detail determining the difference between success and failure.

Tropacocaine hydrochlorate of reliable manufacture is employed, because this preparation possesses less toxic properties than cocaine hydrochlorate; the absence of this toxicity however is believed in a certain degree to modify and lessen its analgetic powers. Cocaine hydrochlorate possessing greater analgetic

strength and used in smaller amount, may prove more efficient especially in operations above the umbilicus, but it is believed there would result more frequent toxic manifestations. Future experience and experiment along these lines will alone demonstrate facts.

The practice of the writer has been to prepare from 32 to 80 mgs. tropacocaine hydrochlorate taken from original bottles that are said with their contents to have been previously sterilized, and place the desired quantity (quantity depending upon the operation to be performed) in small glass tubes from one and a half to three inches in length, sealing each end over a flame, being cautious to avoid subjecting the powder to excessive heat. Then make a file mark to facilitate breakage when wanted for use. It is thought best to prepare fresh tubes for each operation, as it is not improbable that an old sterilized product loses its analgetic properties and develops toxic qualities. (See *Archives de Medecine et de Pharmacie Militaires*—Dr. F. Caccia. Translation by 1st Lieutenant Samuel M. DeLoffre, Medical Department United States Army in the JOURNAL OF THE ASSOCIATION OF MILITARY SURGEONS for June, 1905).

Though the tropacocaine powder in original bottles is reputed to be sterile, the writer has been in the habit to invariably resterilize in the glass tubes described, fearing faulty or deteriorated sterilization in original bulk. In his early cases this was accomplished by exposure to high degrees of heat, running the temperature up to 232 degrees C. and subjecting to this heat (dry) half an hour. This was found to be deleterious, weakening the analgetic properties of the tropacocaine. It was this faulty technique that is believed to have been the cause of the partial results obtained in some of the early cases above reported. The practice employed in all the more recent cases, and attended with most satisfactory results and invariable success, has been to sterilize the tubes in boiling water from three to five minutes; this has not been observed to destroy analgetic properties, nor has there been manifestations of after toxic symptoms.

The syringe employed is of glass, with solid glass piston, the ordinary Luer syringe, of 2 c.c. capacity. The needle 7cm. in

length with bore of small calibre, and with sharp but shortened points. From experience it has been found that it is important the glass portions of the syringe should be carefully sterilized in dry heat. If sterilized in moisture the barrel and piston prematurely dissolves the powder in the act of loading, and this solution adhering to the interior, the accurate amount fails to enter the spinal canal. It is also important that the piston be entirely withdrawn and separate from its barrel during sterilization, else the expansion from heat causes the piston to become



Fig. 9. Case XXXIII. Spinal Analgesia.

Prolapsus recti. Application of thermo-cautery before reduction.

adherent, and produces delay and embarrassment.

The needles can best be sterilized by simply boiling in water. For a time the writer subjected these to the same degree of dry heat in which he originally placed the tropacocaine (232 degrees C.), but in one instance this destroyed the temper of the instrument, causing it to break off in the deep ligamentous tissues of the spinal column during the act of puncture, and required a tedious and embarrassing dissection of half an hour under a general

anaesthetic to find and remove the fragment. (As the needle had not entered the spinal canal, there was no opportunity for spinal analgesia, and the case is not reported in the foregoing list). This is the only mishap experienced.

All the aseptic preparations pertaining to the tropacocaine and syringe as described having been carefully observed, the glass tube is broken, and its contents of tropacocaine powder is emptied into the barrel of the syringe separated from the needle, the sterile finger covering the needle opening of the barrel, the powder is allowed to accumulate at this distal orifice; the piston is now carefully inserted in order to avoid premature expulsion of the tropacocaine from air compression, and descends until in contact with the accumulated powder. The barrel is now gently laid aside loosely wrapped in sterile gauze until ready for use.

The patient sits on the long edge of the operating table, feet resting on chair or stool. The back is carefully scrubbed and rendered aseptic by bichloride, alcohol, etc. The operator is prepared as for aseptic operation. The patient is now required to bend the body forward, thus making a bow shape of the spine, resting the forearms on the thighs (See Fig. 6). This is the most convenient position on the part of the patient for the operator, but the same object can be accomplished in any recumbent posture that will expose the lumbar spinal region, such as the Sims position, etc., which is preferable in injuries to lower extremities or when patient is too weak or it is too painful, or is too sick to sit up (See illustration). Standing behind the patient the operator locates the superior iliac crests on both sides, and draws an imaginary line between these two points (See illustration). This imaginary line passes through the interspace between the third and fourth lumbar vertebrae. The spinous processes of these two vertebrae can readily be located by the finger. The space between the two can now be anaesthetized by an ethyl choride spray (see illustration), but as the subsequent puncture of the needle is attended with so little pain, this refinement is really not necessary. The needle *separated from the syringe* is introduced in the median line beneath the lower edge of the third lumbar spinous process. (Care must have pre-

viously been taken to insure that the needle is patulous and freed from all obstruction; a sterile wire stylet having been previously passed through the needle immediately prior to introduction, and every vestige of obstruction carefully removed). The puncture can be made just as readily and effectually in the second and third lumbar interspace, and is the one to be preferred when the operative field is above the umbilicus. The needle should glide with but moderate resistance into the cavity of the spinal canal. Its arrival in this space at once becomes apparent by the sense of

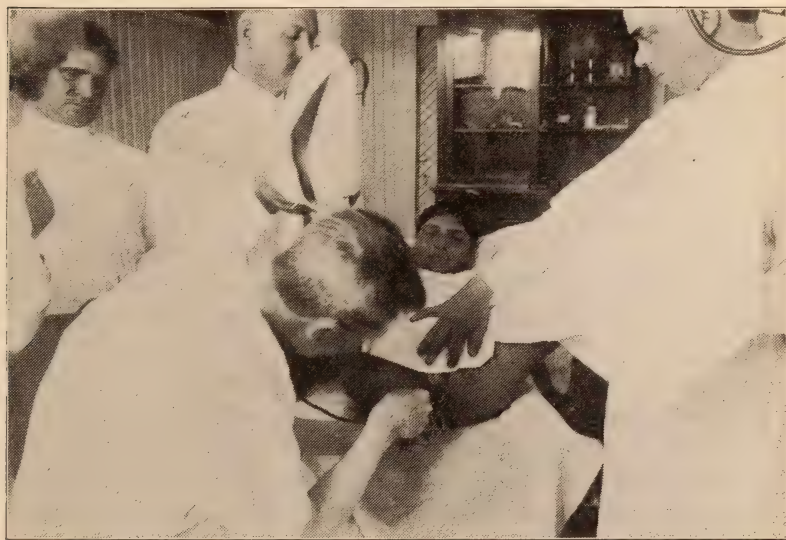


Fig. 10. Case XXXIII. Spinal Analgesia.

Application of thermo-cautery to rectum after reduction of prolapse.

lost resistance communicated to the operator's fingers. Usually at this stage the spinal fluid escapes through the proximal opening of the needle and is checked at once by covering this opening with the sterile finger. If the fluid does not escape or appear at the orifice, a sterile wire stylet is passed to remove any small blood clot or other obstruction; it may in rare instances be necessary to attach the syringe (and for this purpose it is well to have a sterile empty one at hand), and draw a small quantity of the fluid through.

The introduction of the needle is unquestionably the embarrassing and difficult part of the procedure. No undue force should be employed; when a bony or other obstruction is encountered in the passage, which not infrequently occurs, the temptation to employ force must be resisted, for under these circumstances it is certain the needle is not in its proper course; in its proper course there is scarcely any resistance; when obstruction is met it should be partially withdrawn and its direction slightly deviated; repeat deviation until cavity is entered; do not give up for success will be the reward of perseverance in every instance. Practice and experience gives confidence and dexterity. The writer failed to enter the spinal canal in the instance noted by the breaking of the needle; this accident is not expected to again happen in his hands as he yielded to temptation and made the mistake of employing unnecessary force, and the needle had been weakened from over heating.

The needle having entered the spinal canal, and the escape of fluid verified, the syringe loaded with the tropacocaine is attached. The pressure of the spinal fluid, especially in young subjects, usually forces the piston outwards as it enters the syringe, if it does not, the piston is partially withdrawn and about one cubic centimeter of the spinal fluid is permitted to enter; this is more than sufficient to dissolve the contents. Solution can be accelerated by revolving the syringe, but it seldom requires longer than from thirty to sixty seconds. Solution accomplished, the piston is depressed and the contents forced into the spinal canal. The patient is directed to straighten the spine, and the needle is withdrawn; the puncture sealed with adhesive plaster or collodion. The patient can be made ready at once for operation, and by the time the field is prepared, analgesia is present.

The experience of the writer in the foregoing limited number of cases leads to the following conclusions:

1. That in all operations covering the field from umbilicus to toes tropacocaine spinal injection where proper technique is observed, is a reliable and advantageous anaesthetic. That it can be utilized in a certain percentage of operations above the umbilicus.

2. Employed under the technique described it possesses distinct advantages over general anaesthesia. It is under proper technique believed to be devoid of danger. Morton reports approximately 3,000 cases without a death or serious symptom from its employment.

3. In weighing the chances and advisability for operation, the depression and dangers attendant upon general anaesthesia can be eliminated, and the prognosis confined to the patient's resisting powers of the operation *per se*.

4. Under the administration of spinal analgesia the patient is at all times in a normal mental condition, able to assist himself and describe symptoms and conditions; a distinct advantage over the utter helplessness and unconsciousness attendant upon general anaesthesia.

5. The immense comfort and assistance to the operator who may dismiss from his mind the anxiety of accidents and complications attendant upon general anaesthetics, always present despite their most careful and skillful administration.

6. No necessity for undue haste in performance of operation because of jeopardy from prolonged general anaesthesia. Tropicaine spinal analgesia usually continues a sufficient length of time for the performance of any ordinary operation, and there is no objection to a repetition of the injection when called for.

7. The cooperation of the patient in operation secured by this method is of distinct advantage, *e. g.* in operation for the radical cure of hernia; the patient at will under the direction of the operator, by straining or coughing, can protrude the gut, thus serving as a guide to locate, isolate, and dissect the sac. This was well illustrated in case XX reported above.

8. Operation can safely be performed upon a class of cases which would be positively contraindicated if general anaesthesia had to be employed *e. g.* cases XIX, XX, XXIV, XXVII.

9. The absence of vomiting and retching with its attendant disadvantages frequently accompanying the use of general anaesthetics. In tropacaine spinal analgesia it is unnecessary to starve the patient, prior to operation, he can eat his meals as usual.

10. It has been observed that tropacocaine spinal analgesia destroys the sensation of pain only. The patient is sensible to touch of the hand, fingers, and manipulation of all varieties. Is also sensible to draughts of hot or cold air. The special senses seem to be in no way impaired, pain alone being destroyed in the analgetic area.

11. The fact that for more than fifty years people have been educated that there must be absolute unconsciousness, with every sense and faculty occluded during a surgical operation, has its influence in determining accurate results as to sensation in spinal analgesia. This fact in connection with the psychical temperament of the individual must be taken into consideration. In several instances in the writer's experience, the patient when questioned "do you feel this?" has answered "yes;" and unquestionably he did feel the manipulation as plainly as though analgesia was nil and then asked "does it hurt?" reply "no." It has also been observed in some cases that when a subject watched an operation there was fright and complaint; covering the eyes would remove all sense of discomfort. A patient always feels traction, such as removing per perineum an enlarged prostate, a large calculus producing pressure by dragging through the open wound of the perineum, but it is traction without pain.

12. Though personal experience has been very limited, it is believed the employment of tropacocaine spinal analgesia in obstetrics offers most promising results for the relief of its pains.

13. Numerous observers and authorities have condemned spinal analgesia upon experience (and some have presumed without experience) based upon the use of cocaine, beta eucaine, etc., in solution prepared without the body, in contradistinction to the method described in this report, and have obtained unpleasant sequences such as prolonged nausea, vomiting and persistent headaches, all probably due to increased intracranial and spinal pressure from the introduction of a foreign solvent, and the use of cocaine preparations containing toxic properties.

So far as can be determined by the writer the unpleasant after effects accompanying spinal analgesia produced by tropacocaine under the technique described does not exceed three per

cent in all cases, and even in these the headache is very much modified, in no instance assuming an alarming form, and stands in brilliant comparison to the frequent after-effects, dangers and complications incident to general anaesthesia.

It has occurred to the writer that tropacocaine spinal analgesia has its place in military surgery, especially field work and in time of war, and offers the following advantages:

(1) Obviates the necessity for the storage and transportation of the bulk of general anaesthetics; (2) is much more economical than general anaesthetics; (3) the immense saving of time and attention in its administration; (4) the saving in operative personnel,—dispensing with the necessity of anaesthetizers; (5) the saving in number of attendants for individual patients,—after operation under spinal analgesia patient does not require such attention as under general anaesthesia; (6) the saving in number of bearers,—under spinal analgesia patients much more able to assist themselves; (7) its employment on the field of battle, at dressing stations, ambulance stations, etc., would be the means of relieving much suffering, as well as the prevention of shock from pain, and at the same time render the wounded man better able to assist himself to reach the field hospital.

UNCOMPLICATED TROPICAL AMEBIASIS.

TROPICAL amebic dysentery, is discussed by W. E. Musgrave, Manila, P.I. (*Journal A.M.A.*) under four heads:

1. Latent and masked infection. 2. Mild and moderately severe forms. 3. Severe cases, including gangrenous and diphtheritic ones. 4. Infection in children and in the aged. He gives the symptoms, and reports briefly two cases illustrating the insidious nature and the lack of characteristic symptoms in the latent type. The mild or moderately severe cases form the great majority of those seen in Manila at the present time, and most of these develop from the latent cases before mentioned. If early recognized and properly treated, they rarely pass beyond the diarrheal stage, and many, even without treatment, never become dysenteric in the common acceptation of the term. The severe cases develop from these and from the latent ones and their characteristics are well known,

LIVER ABSCESS; SIX CASES; WITH SPECIAL REFERENCE TO THE ETIOLOGICAL IMPORTANCE OF
ASCARIS LUMBRICOIDES.

By JAMES FARQUHARSON LEYS, M.D.,
SURGEON IN THE UNITED STATES NAVY.

THOUGH the modern literature of liver abscess goes back nearly 250 years, the disease was seldom diagnosed *ante mortem* until a century ago, when numerous clinical reports began to appear. From 1803 to 1828 several monographs on the subject were published at Strasburg and at Paris, and within the past thirty or forty years the clinical importance of this condition has been fully recognized, hundreds of cases have been studied, and an extensive literature has grown up.

It has been shown within the past twenty-five years that abscess of the liver is, in a very large proportion of cases, a concomitant or a sequel of amoebic dysentery. In many such cases the amoebae associated with the dysentery have been demonstrated also in the walls of the abscess and in the discharge from it after the first few days. The bacillus of Shiga has not been demonstrated in liver abscess, and it is assumed that abscess is not developed in bacillary dysentery but only in connection with the amoebic form. It is a fair presumption that a case of liver abscess is etiologically connected with dysentery (1) if any history of dysentery or of serious diarrhoea associated with fever or with blood or mucus in the stools can be elicited; or (2) if dysenteric ulcers or scars are found in the intestines post mortem; or (3) if amoebae are demonstrable in the abscess wall or contents. On one or more of such evidences it has been found by many students of the question that a very large proportion, if not the majority, of cases of liver abscess are associated with previous or coexistent dysentery. This must be accepted as a safe conclusion based on observed facts. Various writers, reporting series of ob-

served or collated cases, have found this association with dysentery to obtain in from three per cent* to eighty-four per cent (Johnson Smith) of the cases. In a series of forty cases at Shanghai, Neil Macleod found dysenteric associations in thirty-nine, or ninety-seven per cent.

Jackson,¹ in a series of seventeen cases of liver abscess at Boston, from 1894 to 1899, refers ten of them to antecedent appendicitis and only two to dysentery. A review of the literature shows that liver abscess has frequently been directly referable to an ulcerative appendicitis. In a considerable number of the reported cases the appendicitis was due to the same simple mechanical cause, namely, impaction of a pin in the appendix. Such cases have been reported by Payne,² Legg,³ Ashby,⁴ Netter,⁵ and Church⁶.

The increasing recognition of the importance of dysentery as an etiological factor in suppurative hepatitis has led some recent writers to uphold the idea that it may be the invariable cause. There is a tendency, so it seems to the writer, to force the conclusion beyond the observed facts at hand to support it. Thus Macleod,⁷ influenced by his own experience above referred to, concludes that tropical liver abscess is invariably the result of dysenteric ulceration. If this were so it would be difficult, as Manson remarks, in connection with the Bombay report already referred to, "to believe that so important and evident a circumstance as dysentery had been overlooked seventy-two times in seventy-four cases." The truth would seem to be that in different countries, localities, epidemics, and races there is great variation in the percentage of cases of liver abscess associated with or traceable to dysentery. In many places and many series of cases it appears to be the cause in from fifty to nearly 100 per cent of the cases, while in others it figures in a very small proportion of them.

*Report Sanitary Commissioner, Bombay, 1894.

1. St. Paul Med. Jour., St. Paul, Minn., 1899. i, 403.

2. Trans. Path. Soc. London, 1869-70. xxi, 231.

3. St. Bart. Hosp. Rep., London, 1875. xi, 85.

4. Lancet, London, 1879. ii, 649.

5. France Medicale, 1883. i, 25.

6. Boston Med. & Surg. Jour., 1883. cix, 269.

7. Brit. Med. Jour., 1894. i, 678.

It may be proper to remind the reader that our knowledge of the essential etiology and pathology of dysentery is by no means settled and definite. The *amoeba coli* found in the intestines in health cannot be morphologically differentiated from the *amoeba dysenteriae* found in disease. The amoebae are often absent in dysentery. Their presence in the stools without dysenteric symptoms is no evidence of dysenteric infection; and therefore in liver abscess while their presence in the abscess wall can fairly be, and must be, considered as evidence of their etiological relation to the disease, their presence in the stools only, in the absence of dysenteric symptoms or post mortem lesions, can not be so accepted as evidence.

There is no reason apparent to the writer for assuming that in all cases of liver abscess a dysenteric infection has at some time been present, whether or not any evidence of such exists or any history of dysentery can be elicited. His own limited experience in the six cases herewith reported leads him to attach great importance to the larger animal parasites as carriers of infection into the bile passages and the liver substance.

CASE I.—G. P., Seaman, 33 years, admitted to hospital at Newport, R.I. June 24, 1902 as with atypical pneumonia following influenza. Râles and dullness right lower lobe. Liver dullness normal, region of gall-bladder tender. Patient had not been in tropics for several years. Stated that he had had abdominal pain and bloody diarrhoea prior to his enlistment four years ago. Expectoration purulent, fever of septic type with profuse sweats. Cathartic, and dietary treatment. Temperature became normal on tenth day and remained so. Symptoms subsided. Discharged to duty on twenty-fifth day with note on his record, "Recovery complete."

On duty in apparently good health for fifty-six days. Re-admitted to hospital September 12 with hepatic tenderness and enlargement, No jaundice. Daily evening rise to 102°. Diagnosis of liver abscess and operation on the seventh day, September 18. Lower border of liver on level with umbilicus. No exploratory puncture. Under ether, longitudinal incision five inches long, two inches to right of median line, through upper belly rectus. Exposed liver of a dark purple color with deep fluctuation. Trocar one and one-half inches in liver found pus. Canula plugged and held by assistant. Peritoneum and sheath of rectus sewed to liver with continuous catgut suture. Canula withdrawn. Liver incised till it easily admitted little finger to cavity filled with thick tenacious pus which was evacuated with difficulty and incompletely. No irrigation. Operation a dry one throughout. Large

fenestrated rubber drainage tube fitting liver-opening closely, entering three and one-half inches, large safety pin in outer end. Loose gauze dressing changed after twenty hours and then twice daily. Irrigation after third day. Temperature remained practically normal after operation. Recovery uninterrupted. Patient surveyed and discharged from service November 24, two months and six days after operation, because of "chronic hepatic enlargement and general impairment of health."

Comment: Solitary abscess. Recovery. Probably post-dysenteric. Long period (about five years) between bowel trouble and discovery of abscess. No distinct and satisfactory history of dysentery, in fact patient denied that he had ever had dysentery or was ever laid up with fever in connection with his bowel trouble. Dry, open operation in one stage without previous exploratory puncture. No irrigation till safe from peritonitis.

CASE II.—J. S. C. C., private, U.S.M.C., 29 years, was admitted to hospital, Guam, February 24, 1903, with dysentery. Liver dullness was noted as increased on March 17, but it was normal again a few days later. No jaundice. On April 9 complained of localized pain and tenderness in epigastrium which was thought at first to be referable to an ulcer in the transverse colon. By April 20, enlargement of left lobe of liver with fluctuating temperature and profuse sweats justified diagnosis of liver abscess. Operation April 21. Under ether, incision in left epigastrium, three inches long, parallel to costal border and three-fourths inch below it. Surface of left lobe dusky and fluctuating. Liver sewed to parietes by continuous catgut suture. Trocar in liver evacuated four ounces of creamy pus. Incision and drainage tube as in Case I. Operation well borne. Daily dressing. Irrigation after third day. Temperature normal for a week but no gain in strength or appetite. On ninth day fever returned and patient grew rapidly weaker. No evident indication for another operation and patient would scarcely have borne one. He died on the eighteenth day. The necropsy found firm organized union of the liver to the abdominal wall along the line of suturing, peritoneum clean and healthy, original abscess cavity almost obliterated. Two additional abscesses, one in right lobe containing six ounces and one on under surface of tip-end of left lobe containing about four ounces of greenish creamy pus typical of pyogenic infection. The presence of these abscesses did not alter the size or shape of the organ.

Comment: Multiple pyogenic abscesses following dysentery. Fatal.

CASE III.—W. E. S., Commander, U.S.N., 52 years, admitted to sick list at Guam, January 4, 1904. Morning temperature 99.4°, evening 101.3°. Indefinite abdominal uneasiness. On January 7, evening temperature 102.4°; January 8, 103.2°. Pulse continued strong and never more rapid than ninety to the minute. The lumbricoid worm found in practically all persons resident in the island for any length of time; on January 11 santonin and calomel were given, and the next day, in eight stools, one full grown lumbricoid was passed. Stools were not of any abnormal character. A remittent type of

fever continued with no sustained improvement in the patient's condition. Took nourishment well. On January 15 he was better. On January 16 he had a chill and fever 102.8°. Repeated blood examinations for malaria negative; a leucocytosis was noted. Urine always normal. Had one normal stool daily. On January 18, pain, referred to right hypochondrium. Liver dullness remained normal. No jaundice. January 21, better. January 23, chill, higher fever, profuse sweating, January 24, better again. Enema given,—feces examined for ova,—negative. Continued uneasiness and occasional marked pain always referred to liver region. Liver dullness apparently slightly less than normal; did not extend below costal margin. Moderate tenderness most marked over gall-bladder. Spleen normal. No tumor mass anywhere. A tentative diagnosis was made of *Cholangitis with incomplete obstruction and hepatic intermittent fever*, a condition which has been repeatedly mistaken for appendicitis, for gallstones, or for liver abscess. Quinine bisulphate was prescribed, five grains in capsule twice daily. The patient took the evening capsule on January 24 and had an enema at midnight followed by stool in which he passed about 150 specimens of the Japanese liver fluke, *Opisthorchis Sinensis*, more familiarly known to the profession as *Distomum spatulatum* or *Distomum japonicum*. The fresh specimens were easily and accurately identified. A correct diagnosis of *distomatosis* was made, therefore, on January 25, the 22d day of his illness.

The previous history of the case was at once made clear. Six years before the patient had been a messmate of mine and I had seen him from time to time and known him well ever since. He was often complaining of abdominal uneasiness, sense of weight, indigestion. But he had done much arduous duty and was never on the sick-list during my acquaintance with him until this final illness. He had been in Japan during the years 1891 to 1894 and the exposure to the invasion of the distoma undoubtedly occurred at that time. He was never well afterward. He stated that he had never had dysentery in his life and there is no reason to question this statement. He was, by habit, a man given to intelligent observation and careful statement. Moreover, I have received the official records of his health, from his admission to the Naval Academy in 1867 until his death, and find no record of any illness which might have been dysentery. According to the statements of friends and relatives the patient and his wife while in Japan lived according to the native fashion. Both of them began to suffer with digestive troubles shortly afterwards. The symptoms were obscure. The wife died a few years ago with, as stated by her father, very much the same symptoms her husband showed during his last illness.

The most marked improvement followed the above mentioned discharge of parasites, the temperature remaining normal for forty-eight hours and the patient feeling much better in every way. Sodium phosphate was given, followed by thymol gr. x in capsules, but no more distoma were ever found. Liver remained normal or sub-normal in size. Patient embarked and sailed

for home on January 27, passing out of my care and observation on that date, and it is to the official record of the case by Surgeon C. P. Bagg that I am indebted for the remainder of his history.

At Honolulu, en route, about February 12, enlargement of the liver was first noted. He was transferred to hospital at Mare Island on March 1. On March 4, hepatic abscess was thought probable, a large aspirating needle was introduced through the eighth interspace in the axillary line and 700 c.c. of pus were removed through the needle. An incision was then made alongside the needle with evacuation of as much more pus. Large drainage tube inserted. Patient was in a weak state and delirious. No anesthetic was used. Irrigation and dressing daily. One week later, March 11, wound was enlarged and exploring finger found another abscess cavity from which 600 c. c. of pus escaped. In spite of stimulation and normal salt injections he failed steadily and died on March 17.

The necropsy showed entire right lobe of liver involved in larger and smaller pus cavities. Left lobe not involved. Gall-bladder thickened. Peritoneum and intestines normal. No distoma found. They had apparently been destroyed in the suppurative inflammation. The large abscess was well drained. It could be traced directly down upon the cystic duct and a chain of small abscesses led from the duct through the remaining liver tissue of the right lobe.

Comment: No connection with dysentery. Abscesses resulted from the invasion of the fluke, *Opisthorchis sinensis*, which directly by its irritating and distinctive action and probably by acting as a carrier of pyogenic organisms, caused the inflammation and suppuration. The very large quantity of pus evacuated at the two operations, about 2,000 c.c., is interesting. Dr. Young* reported a case in Bellevue Hospital in 1868 in which five and one-half quarts of pus gushed in a steady stream from a liver abscess on incision with the scalpel.

CASE IV.—G. E. H., sergeant, U.S.M.C.; 44 years, admitted to hospital at Guam, May 29, 1904, with history of twenty years service in the Army and Marine Corps; with repeated attacks of diarrhoea on recent service in Florida, China, and the Philippines. On admission, slight jaundice; liver dullness from fifth rib to two and one-half inches below costal margin; some tenderness to pressure. Spleen somewhat enlarged. Has at present an obstinate diarrhoea with ten to twelve soft, brown, oily-looking stools daily. Given calomel catharsis and liquid diet, Tr. Nucis Vom. mx tid. and bismuth subgallate. June 2, symptoms improved. Liver continued to enlarge and bulge. June 6, diagnosis of liver abscess made. Operation same day. Under ether, vertical incision over most prominent portion, three inches long and three inches to the right of linea alba. Liver stitched to parietes with continuous catgut, then incised, and a globular cavity three and one-half inches in diameter drained of pus. Large tube inserted. Ow-

*Am. Jour. Med. Sci., Phila., 1868, n.s., lv, 125.

ing to weak condition there was shock from operation from which he rallied slowly. Dressed daily with irrigation after third day. Much improved by June 10, temperature practically normal, stools reduced to two daily but of same character as before. Contraction and healing of abscess proceeding. After June 10, temperature became increasingly irregular; patient steadily lost strength and appetite. On June 22, existence of other abscesses being suspected, a large curved trocar and canula about eight inches long was introduced through the wound and thrust in all directions throughout the right lobe, taking care not to go beyond the limits of the organ. No pus found. Diarrhoea again persistent and could not be checked. On June 25, the twentieth day after operation, the patient died of exhaustion.

Necropsy showed abscess was solitary and healed almost to obliteration. There was firm union of liver to parietes at the wound, and no peritonitis. Liver and spleen both much enlarged. Whole large intestine from caecum to anus showed extensive scars of old ulcers. Whole inner surface of colon covered with a glistening, fluted, grayish-white membrane, having much the appearance of coagulated lymph, in long tabs, one end attached to the wall, the other free in the lumen. Some of the tabs were three inches long and as large as the little finger.* There was one small unhealed ulcer. The cause of death was exhaustion from the chronic dysentery.

Comment: Solitary abscess associated with dysentery. Cure of the abscess and death from persistence of the dysentery. Death and autopsy three days after a trocar had been thrust in many directions through the liver substance. Careful search failed to discover any sign of the track of the trocar anywhere in the tissue.

CASE V.—O. E. G., Chief Electrician, 31 years; admitted to hospital at Guam, September 19, 1904. Had been working in the hot tropic sun at mid-day and said he was "knocked out by the heat." Case regarded at first as one of mild heat stroke or thermic fever. Increased liver dullness and tenderness on deep pressure were noted, as signs of hepatic congestion. Patient complained of dull pains in right side. He enlisted in the navy at St. Louis March 20, 1902, and had had no tropical service except at Guam, to which Island he went with me the same year. His only admission to the sick list in his two and one-half years of service had been for thermic fever in January, 1903, from which he recovered in six days and enjoyed excellent health ever since. He was a competent electrician, a well-educated and intelligent man, of good family, and he stated that he had never had dysentery nor any serious bowel trouble in his life. Shortly before his admission on September 19 he had complained of abdominal pain, been given *santonin* and *calomel*, and passed several large lumbricoid worms. The liver continued to enlarge and the patient grew worse. A diagnosis of liver abscess was not made till October 3. Operation was done October 4. The patient's condition suddenly became critical just before the operation. He took ether badly. Operation in one stage by same steps as in previous cases. It was done rapidly,

only sixteen minutes being consumed from first incision to dressing, the ether being given with great caution. In spite of stimulation he died six hours afterward.

Necropsy showed the liver well held to parietes by suture; no leakage of pus. There were three other large abscesses in the liver, two of them in inaccessible situations. Total capacity of all four abscesses about thirty ounces of pus. The pus was thick, creamy, greenish, characteristic of pyogenic infection. The pericardium was firmly adherent throughout, its cavity being obliterated. Intestines normal. No more lumbricoids found.

Comment: Multiple pyogenic abscesses, not associated with dysentery. Quite probably referable to ascarides as irritants and carriers of infection. Concerning the pericarditis, a similar condition was observed at necropsy with multiple liver abscesses associated with lumbricoids in the case reported by Dimock of Bombay which will be referred to later on in this article.

CASE VI.—V. G., Chamorra, 35 years; She fell ill early in November 1904. I have mislaid my original notes and the temperature chart of this case and can only summarize the history very briefly from memory. This woman had not been exposed to dysentery. In more than two years of active practice among the natives in Guam, and among many necropsies performed there I never saw a case of dysentery in a native either clinically or post mortem. The last case of acute dysentery in the garrison occurred in August, 1903, fifteen months before. This native woman had never been out of the island and had consumed only the native food and water. There was no jaundice. Her symptoms were those of gastro-enteritis. She was twice given, santonin and calomel, and passed the first time about thirty lumbricoid worms, and the second time a few days later ten or a dozen more. The intestinal symptoms were relieved but she did not improve. In the course of an illness of several weeks she developed thoracic pain and persistent cough, her temperature assumed a typhoid type, and a dullness, almost flatness, with distant breath sounds, at the base of the right lung in front was at first mistaken for a limited pleural effusion. This proved later to be a large liver abscess on the convexity of the right lobe, which ruptured into the lung. Her temperature thereupon became almost normal. Copious expectoration of pus continued several days. At the end of two weeks this ceased abruptly, fever returned, with profuse sweats, and the dullness increased till it extended upward to the fourth rib and outward beyond the anterior axillary line. The patient's condition became critical, and the signs being those of empyema an exploring needle was thrust through the sixth interspace at the side. Pus was not reached till the pleura had been traversed and the needle had entered the liver several inches. An incision followed immediately with no anaesthetic except the ethyl chloride spray and a large tube was inserted. Drainage having been established the patient again improved greatly for a week or ten days and was in a promising condition

when the sputum became dark colored and offensive, signs of pneumothorax and collapse of the lung suddenly appeared with extreme dyspnoea, and the patient died of exhaustion in two or three days more.

Necropsy showed that the large solitary abscess on the upper and back part of the right lobe had perforated the diaphragm and communicated with the lung. It was well drained through the external incision. The lung was collapsed and gangrenous, and there was an extensive empyema. The intestines were normal and contained no more lumbricoids.

Comment: Solitary abscess not associated with dysentery. Quite probably referable to ascarides as irritants and carriers of infection. Death from pulmonary perforation, gangrene and collapse.

Concerning the value of suturing the liver to the parietes in the operation at one stage, Manson quotes Neil Macleod as considering this step useless on the ground that the stitches would not hold in the soft and inflamed liver tissue. This supposition is a mistake. The necropsies on Cases II and IV in this series showed, eighteen and twenty days respectively after operation, firm, organized, occlusive union along the line of suturing at the wound edge, and not any further extended or irregular union as the result of inflammation incident to the disease. Moreover in Case V, with death six hours after operation, the liver was securely held to the edges of the wound by the suture, not a stitch having parted. The writer wishes also to emphasize his belief that no irrigation should be practiced until the third day has been passed with no evidence of peritonitis, when firm adhesions will have formed.

In three of these six cases of liver abscess, all occurring in the tropics, I think we can safely exclude any association with dysentery. The facts in Cases III and V on which such exclusion is made are as well founded as any previous personal history of a case can be; and if we are going to assume that such patients might have had dysentery and never known it we might as well assume that almost everybody has had dysentery without knowing it.

The fact that dysentery is a precursor or an accompaniment of liver abscess in a very large proportion of cases—in the majority of cases in some localities,—is too well established to be disputed by any one. That certain other cases may be not merely occasional

but frequent and important seems not to have impressed itself upon writers on this subject. Many writers mention *Ascaris lumbricoides* as an occasionally possible cause, none seem to have considered it a frequently probable one. In a lengthy discussion of the etiology of liver abscess in the latest edition of his work on Tropical Diseases, Manson does not even mention it. To the writer it seems not improbable that the lumbricoid worm may be responsible for a very considerable proportion of the many cases having no connection with dysentery. The prevalence and geographical distribution of *Ascaris* is quite consistent with such a view. It is probably the commonest cause of the "banana belly" of the tropics and there are many tropical places where this parasite does most especially reign and revel. This is the case at Guam, where it infests persons of all ages and every condition, and practically every inhabitant acquires and carries lumbricoids in very large numbers several times in his life. They set up not only a general diffuse inflammation in the intestinal mucosa but sometimes produce ulceration; and in two cases that came to necropsy in a single year they were the direct cause of death by perforation and escape into the peritoneum. Since as already shown in the cases cited where ulcerative appendicitis was the precursor of liver abscess, any intestinal ulcer may be the entrance for infection of the liver through the portal vein, the *Ascaris* may thus operate as a cause of liver abscess without migration into the hepatic ducts. Such migration occurs, however, not infrequently. There is a specimen in the Wistar-Horner Museum at the University of Pennsylvania in which the main branches of the hepatic duct throughout the liver are distended and packed with ascarides. There is a similar specimen at the Royal College of Surgeons in London. The death and disintegration of the worms in this situation may be the very circumstance under which they are most likely to cause abscess. Or if not thus disintegrated prior to the abscess formation they would probably often be destroyed in the ensuing inflammation as were the flukes in Case III above reported; so that in either case they would not be in evidence at operation or post mortem.

A very hasty review of the literature discovers much to sup-

port this view that *Ascaris* may be a frequent and important cause of liver abscess. In 1813 Dr. Josiah Hornblower* of Bergen, N. J., reported liver abscess in a girl of ten, evacuated by incision. Eleven live and several dead lumbricoids were evacuated with the pus during a few days following. In 1845, Dr. Bates† of New Orleans reported a case of abscess of the liver which he remarks with a naïve conservatism, was "probably occasioned by forty-two lumbricoid worms found in its substance." In 1862 Mainguet reported a case in which a lumbricoid made its exit from a liver abscess. In the case reported by Dimock‡ at Bombay in 1856, with a large abscess in left lobe, multiple abscesses in right lobe, and the Spigelian lobe completely occupied by a nest of echinococcus cysts, several lumbricoids were found in the intestines, which were otherwise healthy. Dimock believed the echinococcus to have been the *direct* cause of all the abscesses, but asked if there were "any connection between the presence of echinococci in the liver and lumbrici in the intestine?" In 1895 Hohler, and in 1897 Dunkel, reported liver abscesses caused by lumbricoids. Thomson§ of Hongkong in 1901 reports a case in a Chinese girl eight years old, found dead, with a liver riddled with small abscesses. In the abscesses themselves and in the bile ducts were numerous lumbricoids, the intestines were packed with them, the stomach contained a mass of them as large as a man's fist. The organs were otherwise healthy.

There seems to have been a tendency to regard each instance so reported as an isolated curiosity. Such a view is scarcely justified. The writer believes that a very important proportion of the cases not associated with dysentery may be associated with and chargeable to the lumbricoid worm; and that some few cases are referable to others of the larger animal parasites, as in the case of distomatosis here reported. It would appear from such literature on the subject as the writer has had time to examine that this form of liver-fluke-disease, which prevails especially in

*Medical Repository, N. Y. 1813. xvi, 295.

†New Orleans Med. & Surg. Jour., 1845-46. ii, 590.

‡Indian Med. Gaz., Calcutta. 1866. i, 363.

§Jour. Trop. Med., London, 1901. iv 164.

the province of Saga in Japan, does not commonly eventuate in abscess. Such a termination of the disease is not mentioned by Kurimoto* or by Taylor,† though the former, in an extensive study of the disease found enlarged livers in ninety-three per cent and bloody stools in fifty-four per cent of cases.

The writer's conclusions are:—

1. That in a large proportion of cases liver abscess is not associated with dysentery; and the assumption that dysentery has been present at some time in nearly all cases and the patient has overlooked or forgotten it is not justified.

2. That any of the larger animal parasites entering the bile duct and its branches in the liver may well be the direct or indirect cause of abscess; but that such biliary migration is not necessary; any parasite remaining in the intestine and causing inflammation or wounding of the mucosa may be responsible. Tape worms, hook worms, and whip worms would all deserve consideration in this connection.

3. The *Ascaris lumbricoides* is probably not a mere unusual and extraordinary cause of liver abscess, but is an important and frequent cause, possibly after dysentery the most frequent one.

4. That study and further reports are needed on the frequency with which ascariasis precedes or coexists with liver abscess.

MALARIA IN THE TROPICS.

ACCORDING to the experience of Col. W. C. Gorgas, chief sanitary officer, Isthmus of Panama, as told by him in the *Journal A. M. A.*, May 12, malaria is by far the most important disease of the tropics. While the percentage of fatalities is not so great as those of certain other diseases, it is really the disabling disorder *par excellence*. It was malaria that practically prostrated the America Army in Cuba. Even in Havana, where conditions are comparatively favorable, more individuals died every year from malaria than from yellow fever.

*Sei-i-Kwai Med. Jour., Tokio, 1893. xii, 67; 109.

†China Imp. Customs Med. Rep., Shanghai 1884, xxvii, 44; 1885, xxviii, 58.

REPORT OF A PECULIAR CASE OF APPENDICITIS.

By CAPTAIN WILLIAM N. BISPHAM,

ASSISTANT SURGEON IN THE UNITED STATES ARMY.

IN every one's practice cases obscure in origin, etc., are frequently encountered, and reports of such cases are very useful, in assisting in diagnosis and treatment of obscure cases, of similar nature, when encountered in the routine of practice. In such a spirit, this report is made, in hopes that it will be of some assistance to other surgeons.

The report of the case in question is as follows:

Recruit W. W. entered the hospital on the afternoon of February 17th. He complained of severe pain in the back, just below the articulation of the twelfth rib and spine on the right side one inch from the column. Could not lie on that side. Patient had not noticed this pain, until the night before entering the hospital. He had only been in the service one month, and had arrived at the post two days before, so little previous history could be obtained, though he said, that he had never had any abdominal trouble. He had no eructation, hiccough or difficulty in deglutition. Vomited whenever food was taken. Vomitus contained only undigested food. Bowels had not moved for several days. Micturition was normal and examination of urine was negative. The abdomen was not distended, and there was no visible peristalsis, tension, edema, ectasia or fluctuation. Auscultation and percussion were normal. There was no pain on palpation, except over the twelfth rib one inch from the spinal column on the right side. At that point the tenderness was marked, and there was some swelling, but no redness, and the tissues, in the immediate neighborhood were very rigid. On deep palpation over the abdomen no tenderness or other sign could be elicited. The lower edge of the liver could be mapped out just below the border of the twelfth rib, but no other abdominal organ could be palpated. The conformation and consistence of the abdomen were normal. Temperature 104.8°F, pulse 106.

With this symptom complex, I decided that there was pus somewhere beneath the localized area in the back, so I gave orders for him to be prepared for operation the next morning.

At nine o'clock February 18th, under ether anaesthesia I made a linear incision, parallel to the spinal column and directly over the area of swelling and tenderness. On palpation before making the incision I noticed a de-

cided tumor without fluctuation, which proved to be a small haematoma about the size of a pigeon's egg in the latissimus dorsi muscle. I cut through the muscle, carefully examined the liver, kidney, colon and pelvis. I also opened the peritoneum and examined its contents as far as I could. Everything seemed to be normal with no adhesions or exudates of any kind, so I sutured the wound and dressed the case, as soon as possible, for he was standing the anesthetic very badly. Before the operation his temperature was 102°F, pulse 102. Afterward his pulse remained the same, but his temperature went up to 102.4°F. At 9 a. m. there was still a high leucocyte count and the differential count was polymorphoneuclears 86.5° small lymphocytes 7.5°, large lymphocytes 5.6°, eosins .4°, masts 0.

Feb. 19th: Temperature 103°F, pulse 110 at 9 a. m. and a little higher in the afternoon. Toward evening he developed some tympanites with pain and tenderness over the right side of the abdomen. Vomiting decreased. Leucocyte count 20,000, with the following differential count; polymorphoneuclears 84.4° small lymphocytes 5.1°, large lymphocytes 10.5°, eosins 0, masts 0. At night I gave him 8 m. morphia for sleeplessness.

Feb. 20th: Patient was much worse. At 9 a. m. temperature 102.4°F, pulse 100. His condition was so very bad, that on consultation with other members of the hospital staff, I decided to delay further operative procedure, until he became stronger, as there was much danger of his dying upon the table. There were no signs of diffuse peritonitis, but the local involvement on the right side of his abdomen was more pronounced. He still continued his leucocytosis and his differential count was polymorphoneuclears 91.1°, small lymphocytes 2.6°, large lymphocytes 6.3°, no eosins or mast cells. I gave him an enema in the morning with profuse results and much relief. That was followed by another in the afternoon and he also received 1m. of strychnia every three hours, hypodermically. To inhibit the growth of the infection as much as possible, I packed his abdomen in ice.

Feb. 21st. Patient rested much easier on the night of the 20th, and was stronger. Temperature 99.8°F., pulse 102. His leucocytosis still continued and a differential count showed polymorphoneuclears 95°, small lymphocytes .6°, large lymphocytes 4.4°, no masts or eosins. At nine I operated on him under ether anaesthesia. He stood the anesthetic very poorly and continuous transfusion of normal salt solution had to be given frequently. The old incision was opened and several pus cavities were found in the muscular tissue of the back next to the peritoneum. These were thoroughly evacuated and cleaned. I then made an incision in the right iliac region and found the appendix in its normal relation. Its tip was perforated and it was surrounded by a localized peritonitis. On examining the peritoneum closely, I found a small ulcerated hole through the peritoneum, just beneath the appendix, which communicated with the cavities in the back. After excising the appendix and turning in its stump with a purse-string suture I cleaned out

the abdomen as thoroughly as possible with sponges and dressed with plain gauze after introducing rubber tubes and gauze drains in both incisions.

Patient was in very bad condition after he recovered from the anaesthetic and in spite of repeated stimulation, he died that night.

Autopsy: On opening the abdomen, I found a localized peritonitis extending from caecum to under side of liver and across to stomach. The abdominal contents were normal in appearance without the least exudate on their peritoneal coverings. The peritoneum back of the caecum was perforated, leading into several abscess cavities in the muscle of the back. There was considerable extra-peritoneal inflammation, which extended into the pelvis. Kidneys were normal. Spleen and pancreas normal. Liver contained several hemorrhagic infarcts on its superior surface and also a beginning abscess on upper surface of right lobe. Heart contained a small clot, but was otherwise normal, the right lung was much congested but there was no consolidation. Left lung and pleura were normal.

From the history of the case one can realize, how hard it is at times to make positive diagnoses of abdominal affections. Though the case presented many difficulties I should think, that one such case in a man's practice, would prevent in the future errors of a similar nature. I myself am fully determined that whenever a patient presents severe surgical symptoms in any part of the lower half of the trunk, and incision over the part does not show sufficient cause for the severity of the symptoms, I intend to carefully examine the abdominal contents, for as one surgeon aptly remarked, ninety-nine out of every hundred cases of infection in the trunk below the ribs start with the intestines.

BUBONIC PLAGUE.

A. STRAUCH, Chicago, (*Journal A. M. A.*, May 19), gives an interesting account of a trip on a plague-infested ship from Trieste to Brazil, by way of Alexandria, at which place the ship became infected. The connection of the ship rats with the outbreak was very evident, as well as the effectiveness of the measures taken to prevent its spread. Every precaution was taken to prevent contact with the infected vermin, and only when the apparent immunity had made the men careless did new cases appear. He mentions other similar ship infections and points out that experience teaches the necessity of thorough systematic extermination of rats in ships, docks and warehouses, and thorough disinfection of cargoes as a measure of international quarantine.

Contemporary Comment.

THE VELO-LITTER OF CHAVERNAC.

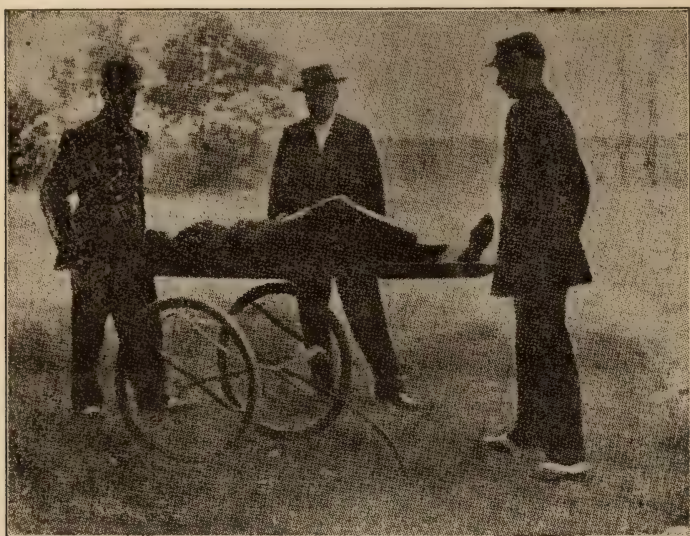
THE problem of the wheeled litter has been excellently solved by Dr. Chavernac of Aix, in Provence, by means of a simple and convenient litter divided longitudinally into two equal parts, with a pair of rubber tired wheels, entirely independent, upon which any of the litters may be readily applied. The litter is entirely rigid, and is divided into two equal symmetrically curved parts, which may be fastened together by a simple appliance. The object of the division is to simplify the loading of the patient and his deposition upon an operating table. The open framework avoids the disadvantage attending a canvass covered litter in case of soiling by blood or excrementitious products so annoying and dangerous in case of the ordinary litter, but easily removed from an open framework such as this. The addition of the bicycle wheels greatly facili-



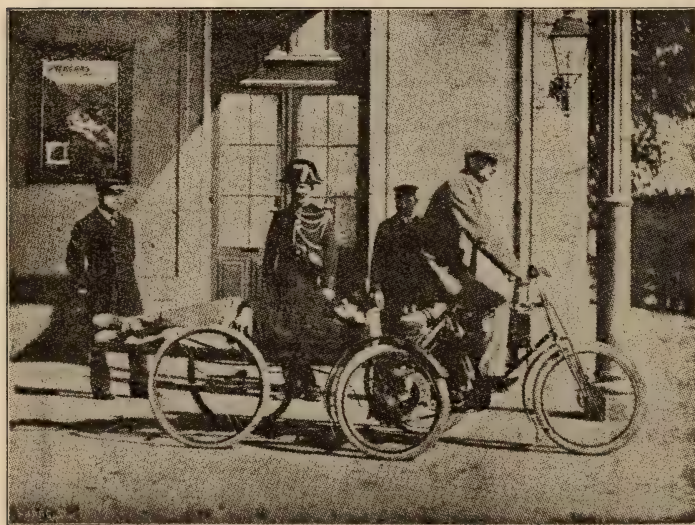
The Velo-Litter.

The Halves Separated Preliminary to Lifting the Patient.

tates transportation, and the employment also of a tricycle, as



The Velo-Litter.—Mounting the Litter upon the Carriage.



The Velo-Litter.—Drawn by a Tricycle.

shown in the illustration, makes rapid transport possible where good roads will permit, even with a shortage of bearers.

Medico-Military Index.

MEDICO-MILITARY ADMINISTRATION.

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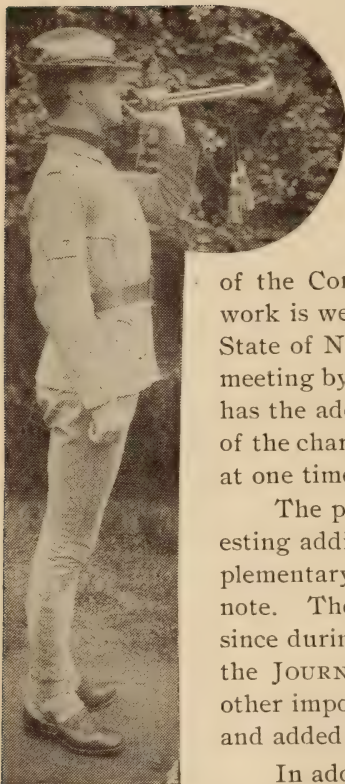
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Editorial Expression.

THE BUFFALO MEETING.



NOTHING has been omitted by the efficient committee in charge of the arrangements for the Fifteenth Annual Meeting of the Association at Buffalo on September 11th to 14th. Major Herbert P. Bissell has been appointed Chairman

of the Committee of Arrangements and the work is well advanced. The Governor of the State of New York will be represented at the meeting by General Nelson H. Henry, who has the added distinction of having been one of the charter members of this Association and at one time a Vice President.

The program is receiving numerous interesting additions, as will be seen from the supplementary list of papers appended to this note. The list however cannot be complete, since during the period between this issue of the JOURNAL and the meeting, a number of other important contributions will be received and added to the program.

In addition to the foreign representatives already reported, Drs. Ch'en Shih-hua and Chou Kuei-Sheng, military surgeons of the first class, have been delegated by the Chinese government, and Staff Surgeon Arthur Caskell, R. N., has been appointed by the British Lords of the Admiralty to represent the English naval service.

It seems probable that there will be an active competition for the place of the next meeting, a number of invitations having been received from various sources, some of which will be eagerly pressed.

The railways have extended to the Association the usual courtesy, allowing a rate for the round trip of a fare and a third, upon the certificate plan, for the entire country, including the whole of the United States and eastern Canada. In order to secure the special rates, members of the Association should carefully adhere to the following instructions:

Tickets at full fare for the going journey should be secured not earlier than September 7th nor later than September 11th, obtaining at the time of purchase a *certificate*, not a receipt.

On arrival at Buffalo the certificate should be presented to the clerk of the Committee of Arrangements, who will see that it is certified and duly returned.

These certificates must all be in the hands of the clerk by September 12th, when a special agent of the Trunk Line Association will be in attendance to validate them.

These rates are conditional upon an attendance of not less than one hundred persons holding certificates, and it is important that every person attending the meeting should obtain a certificate in order that the full number may be attained and the reduced rates secured by our members.

At the Public Meeting the following addresses will be delivered:

The City of Buffalo. - - By *Hon. J. N. Adam*, Mayor of Buffalo.

The State Military Forces. By *Brevet Major General Samuel M. Welch*, Colonel of the Sixty-fifth Regiment, N.G., N.Y.

The Medical Profession. By *Major Roswell Park*, Professor of Surgery in the University of Buffalo.

The State of New York. By *Brigadier General Nelson H. Henry*, Adjutant General of New York.

The following additions to the program as published last month are announced:

Reports of Officers and Committees.

1. Report of the Executive Council.
2. Report of the Secretary and Editor.
3. Report of the Treasurer.
4. Report of the Literary Committee.
5. Report of the Public Service Medical School Committee.

Reports of Committees.

6. Report of the Committee on Legislation.
7. Report of the Committee on International Congress of Military Surgeons.
8. Report of the Committee of Arrangements.
9. Report of the Enno Sander Prize Medal Board of Award.

The Training of the Medical Officer of the State Forces to best qualify him for Local Service and for Mobilization with National Troops.—A twenty minutes abstract by the successful competitor for the Enno Sander Prize for 1906.

The author believes that harmony with the training of the regular military medical officer is the keynote of the successful adaptation of the medical officer of the state forces to the demands of the service, closely followed by the full recognition of military medicine, surgery and hygiene as a distinct professional specialty, requiring thorough qualification in (I) the special professional knowledge included under (1) military medicine, (2) military surgery, (3) military hygiene; (II) medico-military administration, including (1) the selection of men, (2) definite organization of work, (3) the command of men—(a) the hospital corps, (b) the sick—(4) camp location and organization, (5) field hospital construction and composition, (6) the instruction and drill of the sanitary soldier, (7) "paper work;" (III) the evolution and maintenance of a medico-military esprit de corps, (1) national patriotism and state loyalty, (2) contact with men and literature.

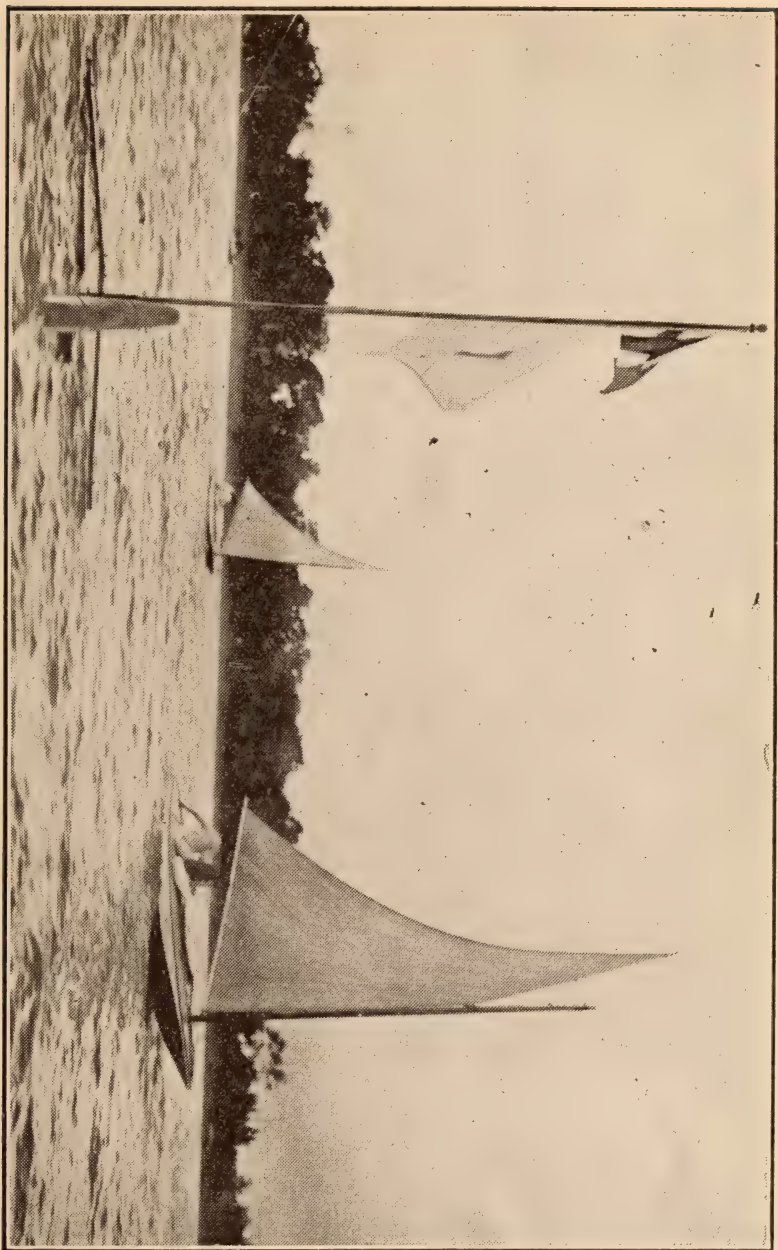
Notes on the Russian Red Cross. By Colonel Valery Harvard, U.S. Army.

An account from personal observation of the organization and work of the Russian Red Cross, chiefly during the Russo-Japanese War.

The United States Marine Hospital at San Francisco in the Great Earthquake and Fire of 1906. By Surgeon Henry W. Sawtelle, P.H.&M.H.S.

Following a brief description of the San Francisco Marine Hospital and of the injury to which it was subjected by the earthquake, and referring to the character of the disaster in general, the author describes the great pressure upon the hospital facilities in general and those of the Marine Hospital Service in particular, and refers to the general work done in connection with the great accident.

Recent Observations on Practical Camp Sanitation with Mobilized Troops in Field and Semi-Permanent Camps. By Lieutenant Colonel Louis M. Maus, U.S. Army and Captain W. J. L. Lyster, U.S. Army.



View on Lake Erie at Buffalo.

The Military Medical Department in the South West African Uprising of 1904-1905. By Stabsarzt Dr. Kuhn, German Army. Translated by Lieutenant George J. Ogden, U.S. Army.

An instructive and valuable account of the work in tropical medicine and hygiene done by the German Officers in the South West African expedition of 1904-1905.

Natural versus Mechanical Ventilation of Hospitals. By Surgeon Preston H. Bailhache, P.H.&M.H.S.

An Economical Plan for a Consumptive Sanatorium with Description of a new "Tent House." By Surgeon P. M. Carrington, P.H.& M.H.S., and Acting Architect J. Ross Thomas, P.H.& M.H.S.

Lower cost of housing a desideratum. Advantage of greater number of small sleeping quarters over large wards or dormitories. Advantages in ventilation. Comparative ease of administration. Description of the unit—the "Tent House." Description of the Toilet and Bath House. Description of the Administration Building.

Milk and Coffee Extract and its use in the Russian Army. By Dr. Wladimir Feodor de Niedman, U.S. Army.

A report of the work of a Russian Army board taking up (1) the condensing of milk, (2) the manufacture of coffee extract, (3) the mixing of milk and coffee and (4) the canning and sterilizing process.

A Description of an Electric Incubator for use aboard Ship. By Passed Assistant Surgeon Richmond C. Holcomb, U.S. Navy.

A detailed description of the electric incubator devised by the author and used on board the U.S.S. *Cleveland*.

The Load of the Foot Soldier. By Colonel Henri Mareschal, French Army.

A discussion of the best location for the burden of supplies to be borne by the individual unmounted soldier, with special reference to the *cartouche lombaire* proposed by Surgeon Major Barthélemy of the French Army, with a view to securing carriage of the load in a physiological manner.

Notes on Recruiting. By Major Henry I. Raymond, U.S. Army.

What constitutes an Army? An effective unit, the least costly. The key note of recruiting, "if in doubt, reject." Uphold the standard and Congress will respond. "Child laborers" and the futility of forcing nature. The Recruiting Officer and the Medical Examiner; *sum cuique*. The Depot and No-Depot system contrasted. "Vagaries" of Army Medical Examiners. Primary medical examination at Recruit Depots, prior to enlistment.



Park Lake Casino at Buffalo.

Method of effecting discharge for disability in cases of recruits. The Recruit Depot System at Columbus Barracks, Ohio.

A Paper, title not announced. By Major Louis Livingston Seaman, U.S.V.E.

A Case for the Chemical Analysis of Water in the Field. By Major Edgar F. Sommer, Indiana N.G.

A description of the case for the chemical analysis of water that has been in use in the Medical Department of the Indiana National Guard for several years, by means of which any medical officer may make a reliable chemical analysis and detect organic matter in water supply when present in toxic doses.

The Opportunities Afforded by the Military Medical Services for Applying Statistical Methods in Therapeutics. By Surgeon (Lieutenant Commander) W. F. Arnold, U.S.Navy, Retired.

The Technique of A Yellow Fever Campaign. By Assistant Surgeon William Colby Rucker, P.H.&M.H.S.

A short account of the methods to be adopted in yellow fever warfare including the sanitary recognizance, the methods to be used for the prevention of the breeding of mosquitoes, the extermination of infected mosquitoes and the prevention of mosquitoes becoming infected from patients in the first three days of the illness; fumigation; "steamigation."

Where Treatment of all Infected is the Surest Prophylactic Measure—the Problem of Epidemic Uncinariasis in Porto Rico. By Captain Bailey K. Ashford, U.S.Army.

Relation of Army and Public Health and Marine Hospital Service to the campaign just completed. Strongly favorable attitude of Insular Government, press, and people to the work. The skin route the true mode of infection. Local habits conducive to spread of disease and traits favorable to its ultimate extermination. Short description of disease and account of its relative severity and extent in the Island. Treatment and relative value of drugs employed. Relative value of feasible prophylactic measures. An opportunity for preventive medicine.

Tuberculosis in the Military Service. By Major George E. Bushnell, U.S.Army.

Enlistment of tuberculous recruits. Unavoidable percentage of the tuberculous among recruits. Physical signs which should lead to rejection. Relation of medical officer to problem of the detection of tuberculosis among soldiers. Hygiene of military posts as affecting development of tuberculosis. Treatment of the tuberculosis at military posts, with especial reference to the disposition of cases. Sanatorium treatment. Its utility as respects segregation, care of advanced cases, cure. Practical difficulties in returning soldiers to duty. The true role of the Sanatorium.

Infantile Scorbutus Presenting Pseudo-paralysis as the Predominating Symptom. Report of case occurring in the Philippines. By Captain Weston P. Chamberlain, U.S.Army.



Monument to the British Dead, at Fort Erie.

Commonly accepted view of infantile scurvy as characterized by pain, hemorrhages, and swollen gums may lead to delay in recognizing pseudo-paralytic cases. Frequency of such cases. Of special interest to Army

Surgeons serving in the tropics where fresh cows' milk can rarely be obtained. Importance of prophylactic use of orange juice as a routine in feeding infants in tropical countries. Desirability of using a fresh milk for infant feeding. In the Philippine Islands goats' milk is a successful substitute for cows' milk and is comparatively easy to obtain. Analyses of goats' milk. Report of case of scurvy characterized by pseudo-paralysis which occurred in the Philippines.

Some new Culicides. By Passed Assistant Surgeon Edward Francis, P.H.&M.H.S.

A report of an experimental research into the mosquito killing power of certain substances.

A Study of West Indian Bilharziosis. By Passed Assistant Surgeon Richmond Cranston Holcomb, U.S.Navy.

This paper deals with the schistosomum infection as found in the West Indies. There is a description of the anatomy of the lateral spined ovum and its miracidium. Certain notes on the free swimming miracidium and the adult male fluke are also included. There is a table of blood counts in some of the cases. The possibility of the lateral and terminal spined ova being eggs of different species of schistosoma is discussed, and the opinion advanced that the variety voiding its ova via the urine, and the variety voiding its ova via the feces are different species of parasite. The paper is illustrated by two water colored plates.

Febrile Icterus in Port Townsend. By Surgeon W. G. Stimpson, P.H.&M.H.S.

An account of an epidemic of febrile icterus, numbering about fifty cases, with one death. The affection was widely contagious and involved men, women and children. Its cause has not been ascertained.

Some French Impressions of the Surgery of the Russo-Japanese War. By Captain Charles S. Butler, M.V.M.

Hand and Instrument Disinfection. By Captain J. Carlisle De Vries, N.G.N.Y.

"Clinical Report of the Use of Yeast in Genito-Urinary Work and Gynecology." By Captain Thomas Page Grant, Kentucky S.G.

A clinical report of some original experiments in the use of yeast, in a number of cases of gonorrhoea and other suppurative diseases, in the urinary and genital organs of the male and female.

Fractures of the Spine. By Surgeon William P. McIntosh, P.H.&M.H.S.

A clinical report of two cases of fracture of the cervical vertebrae,—one

of the fourth and fifth with complete paralysis,—both cases treated by extension and plaster jacket with complete recovery.

Tendon Tissue versus Catgut. By Colonel Nicholas Senn, Illinois N.G.

Tendon tissue preferable to catgut. (1) Tendon is made up of straight fibers running parallel with each other. (2) It is obtained from the cleanest part of the animal. (3) It is stronger than cutgut as the latter is made up largely of muscle tissue. (4) The tendon ligature and suture does not loosen under the influence of moisture like catgut. (5) Tendon material can be made antiseptic by the same method as catgut.

Further remarks on, and Care of Gunshot Wounds of the Abdomen, with Special Reference to the Treatment of Such Wounds of the Urinary Bladder. By Former Assistant Surgeon General George Tully Vaughan, P.H.&M.H.S.

Reports three cases, showing emphatically the importance of early operation, with an additional case of wound of the bladder, which could not be closed with sutures but which was successfully treated by permanent catheterization.

BARON TAKAKI ON THE HEALTH OF THE JAPANESE NAVY AND ARMY.

IN three lectures delivered at St. Thomas's Hospital, London, Baron Takaki gives an elaborate statement of his own endeavors in reorganizing the medical department of the Japanese navy. In the early seventies with only a small navy and comparatively few men, the disabilities from disease were many, the chief cause being beri-beri or kakke. But with innovations in diet, beginning in 1878 came a gradual decrease of all cases of disease; especially in kakke. Elaborate charts and tables lend graphic interest to these lectures, giving numbers of men, rations, diseases and deaths, under different conditions in the navy. Baron Takaki believes the disease beri-beri is due to a disproportion of nitrogenous and non-nitrogenous elements in the food. He therefore attributes the success in getting rid of cases of beri-beri or kakke from the navy in 1890 to the introduction of changes in diet made at his own suggestion. He also refers to the fact that men gained both in weight and in height under the new diet, the average increase in weight being about eight pounds.

C. S. BUTLER.

News of the Services.

Colonel George W. Adair, U.S.A., assigned to duty as Chief Surgeon of the camp of instruction at Islay near Fort D. A. Russell.

Lieutenant Colonel D. M. Appel, U.S.A., ordered for temporary duty on the Presidio Promotion Board.

Dr. James K. Ashburn, U.S.A., returned to Fort Lincoln from duty with troops en route to the camp of instruction near Islay, Wyo.

Passed Assistant Surgeon J. W. Backus, U.S.N., commissioned with the rank of Lieutenant from May 4, 1905, and ordered from the marine detachment at Camp Elliott, Panama, home to wait orders.

Surgeon P. H. Bailhache, P.H.&M.H.S., ordered from Stapleton to Buffalo for special temporary duty and return.

Captain David Baker, U.S.A., ordered to Fort Bliss, Texas, and from Fort Bliss to the camp of instruction at Austin, Texas.

Acting Assistant Surgeon M. C. Baker, U.S.N., appointed from July 23, 1906.

Lieutenant Colonel J. M. Banister, U.S.A., granted one month's sick leave.

Lieutenant C. J. Bartlett, U.S.A., ordered to the camp of instruction at American Lake, Wash.

Lieutenant Colonel Edwin Bentley, U.S.A., retired, has been elected President of the Medical Department of the University of Arkansas.

Captain William N. Bispham, U.S.A., ordered to accompany troops from Fort Wingate to the camp of instruction near Fort D. A. Russell.

Captain H. D. Bloombergh, U.S.A., ordered to accompany troops from Fort Leavenworth to the camp of instruction at Fort Riley.

Passed Assistant Surgeon Rupert Blue, P.H. & M.H.S., ordered from Tuckerton to Atlantic City, N.J., for life saving service examinations.

Passed Assistant Surgeon J. S. Boggess, P.H. & M.H.S., ordered to Freeport and Sayville, N. Y. for life saving service examinations.

Major William C. Borden, U.S.A., granted one and a half months sick leave.

Lieutenant John R. Bosley, U.S.A., ordered to accompany troops from Fort Egbert to Skagway, Alaska. and ordered to Jefferson Barracks.

Captain Louis Brechemin, Jr., U.S.A., ordered to the camp of instruction at American Lake, Wash.

Passed Assistant Surgeon J. M. Brister, U.S.N., ordered from the *Philadelphia* to the *Pennsylvania*.

Captain William H. Brooks, U.S.A., ordered from Fort Washington to Camp Roosevelt, Mt. Gretna, Pa.

Assistant Surgeon H. L. Brown, U.S.N., ordered to the Washington Navy Yard.

Dr. Ira C. Brown, U.S.A., granted two months sick leave from Fort Niobrara.

Lieutenant O. G. Brown, U.S.A., ordered to duty in the Philippines, September 30, 1906.

Dr. Wilmont E. Brown, U.S.A., ordered from Fort Walla Walla to Fort Stevens for temporary duty.

Captain Carroll D. Buck, U.S.A., ordered from Fort Leavenworth to the Presidio General Hospital.

Passed Assistant Surgeon C. S. Butler, U.S.N., ordered from the *Columbia* to waiting orders and to the San Juan Naval Station.

Dr. Caspar R. Byars, U.S.A., returned to Jefferson Barracks from leave.

Surgeon D. N. Carpenter, U.S.N., ordered to the *Raleigh*.

Major Edward C. Carter, U.S.A., ordered to duty at the camp of instruction at Fort Riley.

Dr. Alpha M. Chase, U.S.A., ordered to the camp of instruction at Austin, Tex.

Captain James R. Church, U.S.A., ordered to accompany troops from Fort Robinson to the camp of instruction at Fort D. A. Russell.

Lieutenant John A. Clark, U.S.A., ordered to the camp of instruction, Chickamauga, Ga.

Major Joseph T. Clarke, U.S.A., ordered to accompany troops to the camp, of instruction at Mt. Gretna, Pa.

Captain Jere B. Clayton, U.S.A., ordered to the camp of instruction at Fort Riley, Kansas.

Captain C. G. Collins, U.S.A., ordered from Fort Walla Walla to the camp of instruction at American Lake, Wash.

Lieutenant C. H. Connor, U.S.A., ordered from Fort Stevens to the camp of instruction at American Lake, Wash.

Lieutenant Colonel William H. Corbusier, U.S.A., ordered from Vancouver Barracks to duty as Chief Surgeon of the camp of instruction at American Lake.

Captain Charles L. Cragin, Me. V.M., has been promoted from Lieutenant and Assistant Surgeon vice Captain G. B. Elliott appointed Regimental Adjutant.

Major William D. Crosby, U.S.A., ordered to take temporary charge of the Chief Surgeon's Office, Department of the Columbia.

Captain Wilson T. Davidson, U.S.A., ordered to the camp of instruction at American Lake, Wash.

Dr. Oscar F. Davis, U.S.A., ordered from Fort Des Moines to the Philippines, and granted three months leave upon being relieved from duty at Fort Des Moines.

Major S. Griffith Davis, Md. N.G., has been promoted from Captain.

Lieutenant Colonel William B. Davis, U.S.A., appointed Chief Surgeon of the camp of instruction at Fort Benjamin Harrison.

Captain William T. Davis, U.S.A., ordered with Co. A Hospital Corps to the camp of instruction at Chickamauga.

Dr. George W. Daywalt, U.S.A., granted one month's sick leave from Fort De Soto.

Acting Assistant Surgeon J. M. Delgado, P.H. & M.H.S., granted one month's sick leave.

Surgeon C. M. de Valin, U.S.N., ordered from the *Alabama* to the *Washington*.

Captain J. R. Devereux, U.S.A., granted one month's extension of leave and ordered from Fort Logan to the Washington General Hospital.

Assistant Surgeon J. C. Downey, U.S.N., appointed with the rank of Lieutenant (j.g.) August 1, 1906.

Lieutenant L. C. Duncan, U.S.A., ordered to accompany troops from Fort Snelling to the camp of instruction at Fort Benjamin Harrison.

Passed Assistant Surgeon Baylis H. Earle, P.H. & M.H.S., ordered from duty as Recorder of the Inspection Board in the District of Columbia to temporary duty at the Hygienic Laboratory, and to proceed to Ocean City, Chincoteague, Wachapreague and Cape Charles City.

Dr. Robert L. Felts, U.S.A., returned to Fort Sam Houston from temporary duty at Camp Mabry, Austin, Tex.

Captain Charles E. B. Flagg, U.S.A., ordered from Vancouver Barracks to the camp of instruction at American Lake.

Captain Clyde S. Ford, U.S.A., ordered from the New York Medical Supply Depot to the Philippines.

Major E. B. Frick, U.S.A., ordered to take charge of the Chief Surgeon's Office, Department of Dakota, during the absence of that officer on detached duty.

Passed Assistant Surgeon A. J. Geiger, U.S.N., promoted from Assistant Surgeon, commissioned with the rank of Lieutenant from May 6, 1906, and ordered from the *Brooklyn* home to wait orders.

Captain Harry L. Gilchrist, U.S.A., ordered with detachment of Co. A Hospital Corps, to Camp Roosevelt, Mt. Gretna, Pa.

General Alfred C. Girard, U.S.A., retired, has taken up his residence in Chicago where he will engage in medical practice. General Girard at the time of his retirement, it will be remembered, was Chief Surgeon of the Department of California, and remained in that city until the time of the earthquake when he rendered valuable services as chief of the hospital work in that city.

Passed Assistant Surgeon Joseph Goldberger, P.H.&M.H.S., ordered to report to Passed Assistant Surgeon M. J. Rosenau, Chairman of the board making investigations as to the prevalence and origin of typhoid fever in the District of Columbia.

Dr. Samuel A. Greenwell, U.S.A., ordered from Fort Barrancas with troops to the encampment of the Florida National Guard at Tampa.

Surgeon G. M. Guiteras, P.H.&M.H.S., ordered to Ceiba, Honduras, for special temporary duty.

Acting Assistant Surgeon A. L. Gustetter, P.H.&M.H.S., granted one month's leave.

Lieutenant James F. Hall, U.S.A., ordered from the Presidio General Hospital to Fort Flagler.

Lieutenant Colonel George Halley, N.G.Mo., was recently attacked with apoplexy at Eureka Springs, Ark., whither he had gone for his health.

Lieutenant H. S. Hansell, U.S.A., arrived in San Francisco from the Philippines and ordered to the Presidio of San Francisco, and from the Presidio to the camp of instruction at American Lake.

Dr. Herbert I. Harris, U.S.A., relieved from duty in the Philippines and ordered to Fort Snelling.

Lieutenant J. R. Harris, U.S.A., ordered to duty in the Philippines, October 8, 1906.

Captain E. H. Hartnett, U.S.A., ordered from Fort Hancock to the Philippines.

Captain F. M. Hartsock, U.S.A., relieved from examination of recruits at New York.

Colonel Philip F. Harvey, U.S.A., appointed Chief Surgeon of the camp of instruction at Camp Roosevelt, Mt. Gretna, Pa.

Captain George P. Heard, U.S.A., ordered from the Presidio General Hospital to Fort Wingate.

Dr. John R. Hereford, U.S.A., ordered from Fort Moultrie to Fort Caswell.

Captain Louis T. Hess, U.S.A., ordered to accompany troops from Vancouver Barracks to the camp of instruction at American Lake, Wash.

Lieutenant James D. Heysinger, U.S.A., assigned to duty as surgeon of the transport *Sherman*, and ordered to duty in the Philippines, September 30, 1906.

Passed Assistant Surgeon W. C. Hobdy, P.H.&M.H.S., ordered to Port Harford, Cal., for special temporary duty and return.

Assistant Surgeon W. S. Hoen, U.S.N., ordered to the *Philadelphia* with additional duty at the Puget Sound Navy Yard.

Colonel John Van Rensselaer Hoff, U.S.A., assigned to duty as Chief Surgeon of the camp of instruction at Fort Riley, Kansas.

Lieutenant John B. Huggins, U.S.A., ordered to duty in the Philippines, September 30, 1906.

Major M. W. Ireland, U.S.A., ordered from Washington to temporary duty at the Presidio General Hospital.

Dr. Frederick E. Jenkins, U.S.A., ordered from Fort Hancock to the Philippines.

Dr. Charles W. Johnson, U.S.A., ordered from the Philippines to San Francisco, and to Fort Des Moines.

Major Richard W. Johnson, U.S.A., ordered from Fort Crook to the camp of instruction at Fort Riley.

Acting Assistant Surgeon A. McK. Jones, U.S.N., appointed August 7, 1906.

Captain Percy L. Jones, U.S.A., ordered to the camp of instruction, Camp Roosevelt, Mt. Gretna, Pa., and relieved from examination of recruits at Portland, Maine.

Dr. Edward H. Jordan, U.S.A., ordered from Denver, Colo., to San Francisco.

Surgeon P. C. Kalloch, P.H.&M.H.S., ordered to Sayville, N. Y., for life saving service examinations.

Major Frank R. Keefer, U.S.A., ordered from the Presidio of Monterey to the camp of instruction at American Lake.

Lieutenant William L. Keller, U.S.A., ordered to accompany troops from Fort Douglas to the camp of instruction at Fort D. A. Russell.

Dr. John P. Kelley, U.S.A., ordered from Sequoia National Park to the Presidio of San Francisco for temporary duty, and to Fort Miley, Cal.

Acting Assistant Surgeon Karl S. Kennard, P.H.&M.H.S., granted one month's leave.

Dr. James S. Kennedy, U.S.A., ordered from Fort Omaha to Fort Benjamin Harrison for temporary duty.

Surgeon C. P. Kindleberger, U.S.N., ordered to the Olongapo Naval Station.

Captain R. M. Kirby-Smith, U.S.A., ordered to the Presidio General Hospital.

Captain Thomas J. Kirkpatrick, U.S.A., ordered from Fort Moultrie to Fort McPherson for temporary duty.

Captain C. E. Koerper, U.S.A., ordered from the Washington General Hospital to Fort D. A. Russell.

Lieutenant Samuel E. Lambert, U.S.A., ordered to the camp of instruction at American Lake.

Lieutenant Theodore Lamson, U.S.A., ordered to duty in the Philippines, September 30, 1906.

Acting Assistant Surgeon T. Langabaugh, U.S.N., appointed August 7, 1906.

Dr. John F. Leeper, U.S.A., ordered to accompany troops from Fort Duchesne to Camp Islay near Fort D. A. Russell.

Captain William F. Lewis, U.S.A., ordered before the Washington Promotion Board, and relieved from examination of recruits at Chicago.

Lieutenant W. L. Little, U.S. A., ordered before the Washington Promotion Board.

Passed Assistant Surgeon B. J. Lloyd, P.H.&M.H.S., granted one month and ten days sick leave.

Lieutenant Robert C. Loving, U.S.A., ordered to duty in the Philippines, September 30, 1906.

Major Charles Lynch, U.S.A., granted two months leave, and ordered to the encampment of the Ohio National Guard, October 13-20; detail revoked.

Dr. Francis M. McCallum, U.S.A., ordered from Fort D. A. Russell to Fort McKinley, Hawaii.

Dr. Thomas B. McCown, U.S.A., arrived at San Francisco from Philippine service and ordered to Fort Mott.

Passed Assistant Surgeon G. W. McCoy, P.H.&M.H.S., ordered from San Francisco to Fort Stanton.

Major C. C. McCulloch, Jr., U.S.A., ordered to accompany troops from Fort Leavenworth to the camp of instruction at Fort Riley.

Dr. Fred S. Macy, U.S.A., returned to Fort Ethan Allen from leave.

Dr. Marion F. Marvin, U.S.A., returned to Fort Mansfield from temporary duty at Fort H. G. Wright.

Lieutenant Colonel Louis M. Maus, U.S.A., appointed Chief Surgeon of the camp of instruction near Austin, Texas.

Surgeon F. W. Mead, P.H.&M.H.S., ordered from Washington to Point Pleasant, N.J., for life saving service examinations.

Dr. John N. Merrick, U.S.A., returned to duty at Fort Missoula.

Lieutenant E. M. Meyers, of Boone, has been appointed Assistant Surgeon Iowa N.G.

Lieutenant E. W. Miller, U.S.A., ordered from Fort Clark, Texas, to Fort Riley, Kansas.

Dr. William G. Miller, U.S.A., ordered to Fort D. A. Russell.

Assistant Surgeon J. M. Minter, U.S.N., appointed with rank of Lieutenant (j. g.) August 1, 1906.

Surgeon J. M. Moore, U.S.N., commissioned Surgeon with the rank of Lieutenant Commander from January 1, 1905; order to the *Columbia* revoked and directed to wait orders; ordered to the *Puritan*.

Lieutenant W. H. Moncrief, U.S.A., ordered before the Washington Promotion Board, and to accompany troops to the camp of instruction at Chickamauga Park.

Captain John A. Murtagh, U.S.A., relieved from examination of recruits at San Francisco,

Captain George J. Newgarden, U.S.A., ordered home from the Philippines, November 1, 1906.

Captain R. E. Noble, U.S.A., granted one month's leave with permission to apply for one month's extension.

Captain R. P. O'Connor, U.S.A., ordered from the Presidio General Hospital to Fort Leavenworth.

Lieutenant Fred M. Palmer, U.S.A., ordered before the Presidio Promotion Board.

Surgeon E. G. Parker, U.S.N., commissioned Surgeon from March 24, 1906.

Captain R. U. Patterson, U.S.A., ordered from the Presidio of San Francisco with Co. B Hospital Corps to the camp of instruction, American Lake, Wash.

Passed Assistant Surgeon J. H. Payne, Jr., U.S.N., ordered to the *Arkansas*.

Captain R. E. Persons, U.S.A., ordered from Fort Flagler to the Philippines.

Assistant Surgeon General W. J. Pettus, P.H. & M.H.S., reassigned to duty in the Bureau.

Captain James M. Phalen, U.S.A., ordered to the camp of instruction near Austin, Tex., and granted four and one-half months leave.

Lieutenant Omar W. Pinkston, U.S.A., ordered from the Fort Leavenworth Military Prison to the Department of California for temporary duty until November 1, 1906, then to report to the Superintendent of the Army Transport Service for duty; ordered to the camp of instruction, Fort Riley, Kans., instead of to temporary duty in the Department of California.

Dr. Joseph Pinquard, U.S.A., ordered from Fort Leavenworth to the camp of instruction at Fort Riley, and returned to Fort Leavenworth.

Dr. William H. Pomeroy, U.S.A., returned to Springfield Arsenal from leave.

Lieutenant William A. Powell, U.S.A., ordered to accompany troops from Fort Leavenworth to the camp of instruction at Fort Riley, and return to Jefferson Barracks.

Lieutenant Harry S. Purnell, U.S.A., ordered to accompany troops from Fort Mackenzie to the camp of instruction at Fort D. A. Russell, and granted one month's leave.

Captain William W. Quinton, U.S.A., ordered to accompany troops to the camp of instruction at Chickamauga Park.

Captain Irving W. Rand, U.S.A., ordered to accompany troops from the Presidio of San Francisco to the camp of instruction at American Lake, Wash., and from the Presidio to the Philippines.

Major Henry I. Raymond, U.S.A., ordered to the camp of instruction at Fort Benjamin Harrison.

Dr. James Reagles, U.S.A., ordered from Fort Keogh to temporary duty at Fort Assinniboine, and return.

Dr. Michael A. Rebert, U.S.A., ordered from Fort Totton to temporary duty at West Point.

Lieutenant Howard A. Reed, U.S.A., ordered to temporary duty at the Presidio of Monterey, and ordered to the transport *Logan*.

Captain William W. Reho, U.S.A., ordered on practice march from Fort Riley.

Captain Thomas L. Rhoads, U.S.A., ordered from West Point to the camp of instruction at Fort Riley.

Lieutenant E. W. Rich, U.S.A., ordered to the camp of instruction, Camp Roosevelt, Mt. Gretna, Pa.

Major Charles Richard, U.S.A., ordered to take charge of the office of the Chief Surgeon, Department of the East, during the absence of that officer on detached duty.

Lieutenant Robert L. Richards, U.S.A., ordered from Vancouver Barracks to Fort Columbia for temporary duty.

Dr. George H. Richardson, U.S.A., ordered from the *Buford* to the Department of California.

Dr. William H. Richardson, U.S.A., ordered from Fort Sheridan to the camp of instruction at Fort Benjamin Harrison.

Passed Assistant Surgeon R. E. Riggs, U.S.N., promoted from Assistant Surgeon, and commissioned with the rank of Lieutenant from January 19, 1906.

Surgeon General Presley Marion Rixey, U.S.N., is on a tour of inspection in the Philippine Islands. He stopped over en route in Japan and was received with great cordiality and enthusiasm by our Japanese confreres, who showed him very many special courtesies.

Captain C. P. Robbins, U.S.A., ordered to accompany troops from Madison Barracks to the camp of instruction at Mt. Gretna, Pa.

Captain Edward P. Rockhill, U.S.A., granted one month's leave, and ordered from Fort Wingate to the Philippines.

Assistant Surgeon N. Roberts, P.H. & M.H.S., ordered from Fort Stanton to temporary duty in the Washington Hygienic Laboratory.

Captain F. F. Russell, U.S.A., ordered to accompany the Signal Corps from Benicia Barracks to the camp of instruction at American Lake, Wash.

Assistant Surgeon T. W. Salmon, P.H. & M.H.S., granted one month's leave.

Lieutenant George H. Scott, U.S.A., ordered to the camp of instruction near Fort D. A. Russell.

Captain Herbert G. Shaw, U.S.A., ordered to the Presidio General Hospital.

Dr. James E. Shellenberger, U.S.A., ordered to accompany troops from Fort Sam Houston to the camp of instruction near Austin, Tex.

Captain M. A. W. Shockley, U.S.A., arrived in San Francisco from the Philippines, ordered to Fort Wright and granted one month's leave.

Lieutenant J. R. Shook, U.S.A., ordered from Fort Des Moines to the camp of instruction at Fort Riley.

Captain George A. Skinner, U.S.A., ordered from Fort William Henry Harrison to the camp of instruction at American Lake, Wash.

Dr. Ernest F. Slater, U.S.A., returned from temporary duty at Fort Adams to Fort Hancock.

Dr. John T. H. Slayter, U.S.A., ordered home from the Philippines, October 10, 1906.

Acting Assistant Surgeon H. L. Smith, U.S.N., ordered to the Philadelphia Naval Hospital.

Lieutenant Lloyd L. Smith, U.S.A., ordered from the transport *Logan* to West Point.

Dr. Rodney D. Smith, U.S.A., granted two months leave.

Dr. Calvin D. Snyder, U.S.A., was killed by Pulajanes, August 9, 1906, near Julita, Leyte, P. I.

Major Henry D. Snyder, U.S.A., ordered to accompany troops from Fort Sam Houston to the camp of instruction at Austin, Tex.

Lieutenant C. J. Stedman, U.S.A., ordered to the camp of instruction at American Lake and thence to Fort Stevens.

Medical Inspector J. M. Steele, U.S.N., ordered from the Naval Academy home to wait orders.

Major William Stephenson, U.S.A., ordered to the camp of instruction at American Lake, Wash.

Dr. James K. Stockard, U.S.A., returned to Fort Revere from temporary duty at Fort Banks.

Captain John H. Stone, U.S.A., ordered from Key West Barracks to the camp of instruction at Chickamauga.

Dr. Harrison W. Stuckey, U.S.A., ordered to the camp of instruction at Fort Benjamin Harrison, and from Fort Snelling to the Philippines.

Dr. Frank Suggs, U.S.A., returned to duty at Fort Michie from leave.

Lieutenant William H. Tefft, U.S.A., ordered to the camp of instruction at Fort Benjamin Harrison, Ind.

Captain Henry D. Thomason, U.S.A., ordered to accompany troops from Fort Huachuca to the camp of instruction near Austin, Tex.

Dr. Clarence A. Treuholtz, U.S.A., ordered from Fort Bayard to Fort Apache for temporary duty.

Captain Albert E. Truby, U.S.A., ordered with Co. B Hospital Corps to the camp of instruction at American Lake, Wash.

Captain Willard F. Truby, U.S.A., ordered to accompany troops from Fort Niagara to the camp of instruction at Mt. Gretna, Pa.

Dr. George B. Tuttle, U.S.A., returned to Fort Columbia from leave.

Surgeon J. F. Urie, U.S.N., ordered home from the *Pennsylvania* with three months sick leave.

Captain F. M. C. Usher, U.S.A., ordered to accompany troops from Fort Brady to the camp of instruction at Fort Benjamin Harrison.

Lieutenant E. B. Vedder, U.S.A., ordered from the transport *Sherman* to duty in the Philippines.

Assistant Surgeon W. W. Verner, U.S.N., ordered to the Pittsburg Naval Recruiting Station.

Surgeon L. L. von Wedekind, U.S.N., ordered to the *Alabama*.

Major Philip G. Wales, U.S.A., arrived in San Francisco from the Philippines.

Passed Assistant Surgeon B. S. Warren, P.H.&M.H.S., ordered to Buffalo, N. Y., for special temporary duty and return.

Acting Assistant Surgeon H. J. Watson, P.H.&M.H.S., granted one month's leave.

Captain Walter D. Webb, U.S.A., ordered to the camp of instruction at Austin, Tex.

Lieutenant A. M. Whaley, U.S.A., ordered to duty in the Philippines, September 30, 1906.

Surgeon J. H. White, P.H. & M.H.S., ordered for special temporary duty at the Mississippi River Quarantine Station.

Passed Assistant Surgeon M. J. White, P.H.&M.H.S., granted one month's leave.

Captain Compton Wilson, U.S.A., ordered to accompany troops from Fort Sheridan to the camp of instruction at Fort Benjamin Harrison.

Captain William P. Woodall, U.S.A., ordered from the Presidio General Hospital to Camp Mabry, Tex., and thence to Fort Clark for duty.

Major R. S. Woodson, U.S.A., ordered from Fort McDowell to the camp of instruction at American Lake, Wash.

Surgeon R. M. Woodward, P.H.&M.H.S., reassigned to duty at Boston

Captain E. P. Wolfe, U.S.A., arrived in San Francisco from the Philippines, ordered to Fort Hancock and granted one month's leave.

Passed Assistant Surgeon B. L. Wright, U.S.N., ordered from the *Arkansas* to the *Columbia*.

OHIO NATIONAL GUARD APPOINTMENTS.—Drs. Robert T. Lawless of Toledo, Clarence E. Beekly and Louis E. Cook of Cincinnati, Lloyd C. Jones, Albert L. Stage and John T. Murphy of Columbus, and Louis L. Syman of Springfield, have been appointed Lieutenants in the Medical Corps of the Ohio National Guard.

SANITATION AT THE CAMPS OF INSTRUCTION.—Orders were sent to the commanding officers of the several United States Army Camps of instruction, established last month, calling attention to the necessity of strict measures to prevent the occurrence of camp diseases and directing that tests be made of regimental sanitary squads composed partly of Hospital Corps men and partly of civilian employees (scavengers) hired by the Quartermaster's Department,—these sanitary squads to be operated under the direction of

the regimental surgeons and under the general superintendence of a Medical Inspector.

TEXAS NATIONAL GUARD.—The organization of the Texas National Guard has been modified so as to make the Medical Department consist of one Colonel, Surgeon General; one Lieutenant Colonel, Deputy Surgeon General; seven Surgeons, Major; seven Assistant Surgeons, Captain; seven Assistant Surgeons, first Lieutenant; a Hospital Corps consisting of five Sergeants—first class, fifteen Sergeants, thirty Privates—first class, fifteen Privates. On July 2, Captains Scurry L. Terrell of Dallas and R. F. Miller of Sherman were examined for promotion to Major. Lieutenants R. L. Dinwiddie of San Antonio and H. F. Sterzing of Austin for promotion to Captain, and Dr. W. L. Robinson of Dawson for appointment as Lieutenant.

TRIAL BY COURT-MARTIAL UPON THE CHARGE OF CHEATING IN PROMOTION EXAMINATION.—A court has been in session in Washington for the trial of Assistant Surgeons Harry Lee Brown and T. N. Pease of the Navy on the charge of having cheated in their examination. The charges were preferred immediately after the completion of their examination and, so far as is known, this is the first time such charges have caused officers to be brought before a court.

The court found Assistant Surgeon Pease guilty of "conduct unbecoming an officer and gentleman" and of "scandalous conduct" and sentenced him to dismissal. The defendant however tendered his resignation and the Secretary of the Navy recommended that it be accepted "for the good of the service."

Assistant Surgeon Brown was found only partially guilty by the court and sentenced to be reprimanded and reduced fifteen numbers in his grade, which will delay his promotion about ten months. Dr. Brown admitted that he had "communicated" during the examination, but the court attached no criminality to his action, there being no evidence to show that he received any information to assist him in his examination. The sentence was approved by the Secretary with the exception of the reprimand, the reduction in number being considered ample punishment for the offence.

Current Literature.

THE INDEX-CATALOGUE.*

THE eleventh volume of the second series of the Index-Catalogue of the Library of the Surgeon General's Office reveals the rapid growth of medical literature and the effective work of the librarians in collecting it in our national medical library. The library now contains 155,292 bound volumes and 271,851 pamphlets, and is a superb indication of the progress of medicine. The mosquito, which occupied but a twelfth of a page in the first series, fills five pages in the new series. The bibliography of the nervous system shows tremendous growth by nearly a hundred pages of titles, which would be extended still further by more than sixty pages were the titles under the subjects of nerves, neurology, neuralgia, neuritis, neuroses and the like included. The literature of diseases of the nose also shows immense activity, covering over eighty pages. The present volume begins with Mo and ends with Nystrom.

THE HOSPITAL CORPS INSTRUCTION BOOK OF THE FRENCH ARMY.†

THE school of the military nurse and bearer of the French Army comprises three parts: (1) professional instruction, designed for all Hospital Corps men; (2) technical instruction for the especial use of the more intelligent men likely to become noncommissioned officers; (3) drill regulations for all Hospital Corps men and bearers. The first and second

**Index-Catalogue of the Library of the Surgeon General's Office, U.S. Army.* Second Series, Vol. xi. 4to; pp. 858. Washington, Government Printing Office, 1906.

†*Ecole de l'Infirmier Militaire.* 24mo; pp. 417, with numerous illustrations. Paris, V. Rozier, 1900.

parts are bound in one volume, and the third part is issued by itself. The little volume which we have under consideration is the first of these. It is a trifle larger than the Drill Regulations of our cavalry, infantry, etc., and about an inch in thickness. The first part includes a description of the personnel and organization, with a detailed section on the management of military hospitals and of the sanitary service in the field. This occupies the first one hundred and twenty-eight pages. The remainder and greater portion of the book is taken up with the technical instruction, divided into three sections requiring a month each for consideration, and includes written work and oral recitations. Dietetics are given a prominent position as well as nosology, minor surgery, and dressings. The management of division hospitals, massage, hydrotherapy and the details of nursing are also included. The book is written in very simple and easily comprehended language, and will be useful in the work of the American military and naval medical officers, as well as to those of France.

WOUNDS BY MODERN WEAPONS OF WAR.*

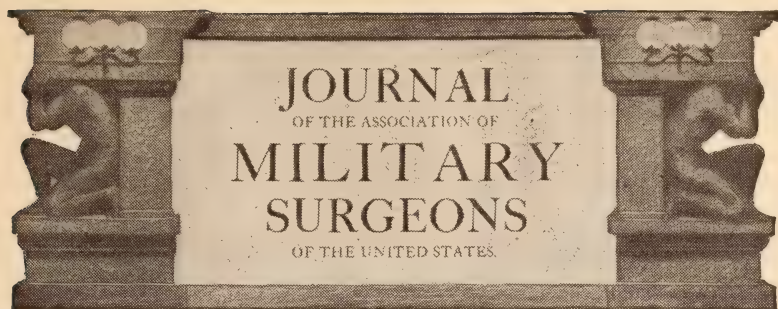
THIS little book covers the general description of the weapons of war; the character of the wounds produced by such projectiles, and the symptomatology of the wounds. The book also gives the pathology as well as the treatment of such injuries of the skin, muscles, bone, bloodvessels and nerves. There are numerous illustrations in this interesting treatise.

YEAR BOOK OF GENERAL SURGERY.†

THE surgical volume of the Practical Medicine Series, under the editorship of John B. Murphy of Chicago, is a double number, and gives a large bulk of surgical information, well stated and excellently selected.

**Die Verwundungen durch die Modernen Kriegswaffen.* By Dr. HILDEBRANDT, 280 pages.

†*General Surgery.* By JOHN B. MURPHY, M.D. Vol. ii. of the Practical Medicine Series, 1906. 12mo; pp. 583. Chicago, The Year Book Publishers, 1906.

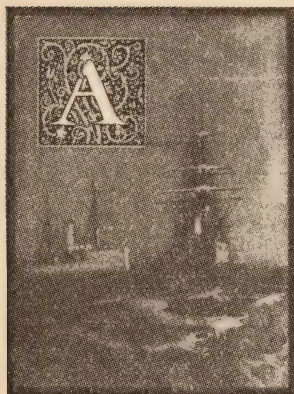


Original Memoirs.

THE EFFECTS OF CLIMATIC EXTREMES ON THE HEALTH OF BATTLESHIP PERSONNEL.

BY CORBEN J. DECKER, M. D.

SURGEON IN THE UNITED STATES NAVY.



SUBJECT that should be of paramount interest to the directors of the Navy is the depreciating effect on the health of the crew of a battleship due to exposure to climatic extremes. How much it has been taken into account is problematical because of the palpable superficiality of the various means taken to avoid such exposure, or when such exposure is unavoidable, to meet the well known contingencies.

It would seem hardly necessary to reiterate the importance of healthy physique in fighting men or to speak of the many depressing influences crews are, or may be, subjected to, for such points seem self evident, but notwithstanding that these things are said to be well comprehended, we

have instance after instance before us of the absence of their consideration.

We have all read with avidity the reports of Admiral Togo, other Japanese officers, and correspondents on the now famous conflict in the Sea of Japan. How Admiral Togo's scouts found that Admiral Rojesvensky was advancing through the Straits of Korea in double column. How Admiral Togo at full speed threw his battleships in exact column across the course of the Russians, thus in professional parlance "teeing" him; receiving only the head-on fire of the leading ships of each column, the rest being blanketed, while he could use a whole broadside of all his ships. How the Japanese, with extraordinary skill, energy and activity, overwhelmed the Russians and obtained a complete as well as an astonishing victory. All the medical world is waiting anxiously for the reports of the Surgeons sent from the various countries to find out the effects of modern war engines. What did they do with their wounded? How many were there? In all this questioning and in all the reports I have read in the papers I have not observed that any stress was laid on the comparative physique of the combatants. People seem to think that the Japanese are active, strong, keen, vigilant because of some unnatural inherent aggregation of superior qualities and that the Russian is naturally powerful, gross, stupid, and slow. To these divergencies they lay all the causes of victory.

Now what were the effects of eight months severe tropical exposure on the health of the Russian personnel? Consider that all of the Russians were unaccustomed to heat and most of them raw recruits. That they were on sea food in the worst climate in the world, off Madagascar, in the Indian Ocean and China Sea. That they came into action after prolonged steaming and drilling in a continuously hot, humid climate against a foe who had been enjoying ideal climatic conditions for at least four months, with no steaming, and drills only sufficient to maintain an excellence already established. Is it not well within the realm of probability that the Russians were all debilitated to a man, and absolutely unfit for the enormous mental and physical strain consequent upon the execution of modern battleship conflict?

As an example of what experts think of the amount of exertion needed to undergo the stress of modern great gun drill the statement of one of them, made to me, is interesting. I was exulting over the fact that the thirteen inch guns of my ship had been fired at the rate of two shots per gun per minute when he said that he did not approve of such rapidity because the guns' crews would be exhausted before half the ammunition was used up. This too under the best of climatic and working conditions.

Take two instances in our recent war with Spain. Admiral Cervera had a fleet in which the men had been exposed to hard tropical conditions for several months. They had been on short rations for six weeks and during this time had been not only underfed but overworked by fighting on shore, in drilling, coal-ing ship and keeping up steam for emergencies. Had their physique been the equal of that of their opponents it is probable that we would have lost a considerable part of our force in the battle of Santiago.

Practically the same considerations apply to the overwhelming defeat of Admiral Montojo.

It is not only the Russian who feels the effects of severe climatic conditions. In my own experience is an interesting and instructive instance. One of our ships was on guard duty in Manila Bay during the trouble with Aguinaldo. This duty required the nightly use of the search lights and steam was maintained so that the ship could be moved under her own power at a moment's notice. This was kept up under the well known climatic peculiarities of a Manila spring and summer for nearly six months. On June the 11th at daylight we got under way to take part in the action at Paranaque and Bakor. At noon the fire room and engine room forces were so depleted from heat exhaustion that the ship could not be moved and was anchored. What might have been the result had we been attacked by a really inferior ship, fresh from the north, manned with a crew overflowing with vim and vigor?

A battleship at best is an uncomfortable, crowded place to live in, and with every possible effort made to insure health and vigor, from six months to a year is necessary to accustom a new crew

simply to living on board. A very large percentage of our crews is raw. Oftentimes the men have only been from one to three months in the service for preliminary training. Worse even than their rawness is their extreme youth. The average age of the enlisted men on the *Alabama* on June 30th, 1905 was 22.92 years. This means that many are under age and ninety per cent of them tender and undeveloped. They have done but little hard work and are unfitted for the strenuous life aboard ship. They have been accustomed to a diversified diet, sleep in a bed and on the average a temperature that would not keep them awake at night. Imagine the results when a crew of such unseasoned, untrained men are put on board and the ship expected to keep pace with others long in commission. The result may be seen graphically by looking at the sick chart of the *Illinois* for the year 1902. That was her first year in commission with a typically raw crew. A glance at the chart of the same ship for 1903 will show how remarkably such a rabble of men can be trained when the ship is given a proper chance by orders to cruise in a temperate climate. In 1902 with tolerably good cruising duty the sick list grew to the large number of five thousand, two hundred forty sick days, for the year and a daily average sick list of 14.3 men with eighty-eight invalided and sent to hospital. In 1903 on the other hand with practically the same amount of exposure to climatic extremes, when the men had been hardened down and learned their duties and had become more accustomed to ship life the sick list fell to one thousand, three hundred sixty-two sick days for the year, a daily average of 3.7 and but thirty-nine men sent to the hospital and invalided.

I shall in this paper attempt to show that a battleship should spend its first six months of commission in home waters with a temperate climate. That it should not be sent off long distances until the men are thoroughly at home with all of their duties and accustomed to the ship diet and routine. That it should never spend more than four or six weeks continuously in the tropics and that any severe cold weather should be avoided.

Before entering into the discussion of these sick records it will be well to call attention to some of the faults of ship con-

struction and discipline that tend to produce sickness and loss of vigor especially when coupled with exposure to climatic extremes.

Ships of the low freeboard type, like the *Kearsarge* and *Oregon* have more crowded living quarters than the high freeboard ships. They must when at sea rely on forced ventilation in all of their living spaces. As a result of this they have a higher sick rate and a lessened factor of physical force. Other things being equal a ship of this class would be defeated in action by a high freeboard ship because of this fact. Even the sick are badly cared for, of necessity, for the sick bay in the *Oregon* class is near the bows and always battened down when at sea, while that of the *Kearsarge* is within the casemate armor. A worse place could hardly be found aboard the ship. All, or practically all, of the space under the berth deck and within the limits of this armor is filled with boilers, engines and dynamos that are a constant source of noise and heat. All of the ventilation is forced and one of the worst features is lack of natural light. Think of operating on an important case when a fuse plug blowing out would put the whole operative field in utter darkness. The placing of a sick bay and operating room within the casemate of a battleship may be compared with the incredible asininity that would be manifest should St. Luke's hospital suddenly determine to turn its subcellar into an operating room and sick ward. Even then St. Luke's would have the advantage of less heat and noise.

As a slight evidence of the difficulty met with in treating the sick on such ships the fact is submitted that in three years of active duty there were sent to hospital, died and invalided from service, from the *Kearsarge*, two hundred and sixty-four men, a number ninety-four in excess of the greatest from any high freeboard ship in the squadron.

If the placing of the sick quarters in such a locality were a necessity of course nothing could or should be said against it. But there is room on the superstructure deck as witness the recent allotment of living quarters for officers there in spite of the statement of constructors that these spaces for many reasons are untenable. Perhaps they may be in battle but in that case, for the probable fifteen minutes or half hour that a modern engage-

ment is expected to last, the sick may be kept under the splinter deck, or, if the probabilities for destruction are as great as our naval writers think, it would not much matter where they went as a move would but mean a choice as to the manner of dying.

The argument that a sick bay and operating room in the casemate and on the berth deck would be available and convenient for treating the wounded in action is all nonsense. In any modern action when there have been wounded at all they have had to wait till after the fighting was done before anything but temporary dressings were applied. Surely we cannot expect with our battleship force of four hospital apprentices and the assistance of a few bandsmen, to make first aid dressings and transport wounded men to a sick bay below decks during the battle. After the battle, if the ship is above water, we may have the whole ship for a hospital if necessary and the operating and dressing done in the best place to be found. Surely no sane man would try to use a closed, stuffy, artificially lighted and ventilated operating room for the urgency work following an action. I have had some experience in treating wounded after actual battle and know that I would stay away from cramped, dark, hot quarters if I could.

The principal function of a sick bay on board ship is to build up weakened muscular and nerve force. To meet this aim no trifling considerations should act to prevent the best possible location.

These two great classes of functional disturbance require our constant attention. Of the two nerve force is most often seriously debilitated. This nerve debility is due to many things. It may not and in most cases does not cause sick day loss directly and seldom appears in statistical reports. The presence of the condition is becoming more and more apparent on battleships and ships cruising in tropical waters and our naval surgeons, experienced in ship conditions, are racking their brains for a remedy. A strong healthy man is ordered to a ship for duty. Within six months he finds that he gets tired on slight exertion out of all proportion to any exciting cause that he can appreciate. This condition continues and grows worse until at the end of his cruise,

if he lasts that long, he is nearly a wreck. In the case of the enlisted man he falls ill with some undefinable fever or other simple trouble and is finally sent to a hospital. In the case of an officer he has indigestion, constipation, headache and in many cases a more or less pronounced neurasthenia. He gets a Medical Survey and a few months leave. Generally he holds on to duty as long as he can because of the custom of the Department to write off the part of his cruise already passed and after his report for duty starting him in on a new tour,—a practical punishment for the crime of illness. Such action by the Department induces in many instances a degree of nerve depression that causes a permanent weakening of the mental and physical powers of the officer which could easily have been remedied.

This depression of nerve force is due to ship life in general and the continuous effects of high temperature and bad ventilation. A statement that may seem dogmatic, but if the records of officers given sick leave for several months, who have sought temperate climes and the open air, will be investigated, it will be found that such change has been without exception of astonishing benefit. Within three years in this fleet, to my personal knowledge, five officers have been surveyed because of neurasthenia and have returned to duty after the treatment indicated.

It is of course impossible to reduce the internal heat of a battleship. Coal in large quantities must be burned. The lamps must be kept lighted. The water must be made and power must be supplied. Firemen must be trained in the methods of their trade and what is just as important, inured to the heat of their stations. This can only come by constant practice. Here again comes in one of the faults of discipline. The hottest division of the living parts of the ship is the berth deck. But here the fireman and coal passer must eat and sleep, if he can, while his brother of the upper decks, whose whole duty is in the open air and light, sleeps and eats in the best sections of the ship. When suggestions are made for a reversal of this custom the answer is made that the berthing and messing of the fireroom force on the gun and superstructure decks would take them too far from their work, an increased distance of probably a hundred

feet, and besides, as they are covered with coal dust and oil, they would soil the paint work.

Fire room work is not essentially unhealthy as proved by the husky multitude of such laborers in civil life, but the fire room force in the personnel of this fleet produces a thirty per cent larger proportion of sick days with the same proportionate increase of invalids to hospital than the deck force.

To return to the sick bay. It should be in the most light and best ventilated part of the ship. This is in the superstructure deck. I have carefully investigated the geography of the *Alabama* and know that there is room on that deck that would if taken, interfere with nothing except the stowing of two three inch field howitzers. Still such is the worship of precedent in the Navy, and so instilled with it am I after nineteen years of service that I would fear to suggest such a change to a Constructor for fear he might have an attack of heart failure.

Fearful and wonderful are the ways of ship builders. It is only recently that a furor was made because of the extra weight of an additional bath tub. Yet the executive officer of one of our battleships removed useless and worthless awning stanchions from a quarter deck and forecastle that weighed many hundreds of pounds. A self constituted board of officers on one of the ships of the fleet estimated by scraping and weighing the old paint on measured areas, that the useless paint weighed over two hundred tons. It may be urged in criticism of this article that such statements are not pertinent to the title but considerations will show that undue weights are important items in increasing the area of the submerged sections, a considerable factor when the temperature of the water is at eighty Fahrenheit.

It seems to be essential that the air intakes for the power ventilators be so placed that either they must get the air immediately abaft or near the smoke pipes or from the after part of the superstructure. In the first place the air is taken in hot, perhaps to keep the men below from becoming chilled, and in the latter place so that the quarterdeck may be relieved of a part of its load of cinders. It was found that the magazines in this fleet of battleships were too hot so pipes were led up from them to

open into the living quarters of the men and officers thus adding to the already vitiated atmosphere the foul gases and hot air from these storerooms.

A brief reference to the quantity of food for the crew of a battleship and the methods and means of preparing it may be of interest. The ship's galley on this ship occupies the forward end of the upper gun deck. It is about forty five feet long and averages twelve feet in width. There is one large boiler for the preparation of coffee and tea. It has a capacity of one hundred and twenty gallons and the average amount of coffee or tea made daily is three hundred and thirty gallons, served during four meal periods. This requires forty five pounds of ground coffee for the day or in the case of tea, eight pounds. There are four other steam boilers, two of sixty gallons, and two of thirty gallons capacity, in which the soups are made or beans, meat or cabbage and other vegetables boiled. The range is twenty feet long and has five fire boxes and five ovens. The ovens are 27" x 16" x 18" in the clear. The crew of this ship requires an average of 1,200 pounds of meat, 70 gallons of soup, 800 pounds of potatoes and 200 pounds of other vegetables daily. There is a bakery on the gun deck run by a head baker and two assistants. He must furnish 750 pound loaves daily. The cooking force of the galley consists of one chief cook and seven assistants. They do all of the cooking and prepare all of the meats for distribution. The ship's crew is divided into messes of about twenty men and one of them is detailed as a messman. He prepares the tables and washes the dishes, brings down the foods and helps prepare vegetables for cooking. For this work he receives from the Government five dollars beyond the regular pay of his rating.

From a glance at the above it will be evident that while the food may be plentiful it must be very plain and of meager variety. Suppose for example the breakfast is fried eggs and bacon with coffee, bread and butter. The coffee, bread and butter are simple matters but to get the eggs and bacon ready to be served at one time as they must be, the cooks begin to fry four hours before

the meal hour. Imagine the condition of the first hundred rations when the last are ready for the table. The same condition holds with any other fried or boiled material.

The food supplied is of good quality usually. At least as good as the market affords but it occasionally happens when in the southern cruising grounds that the supply ships do not come and then local foods must be purchased. Beef grown in the tropics is lean, stringy and tough and no decent vegetables are to be had as a rule.

The diet lists for the Navy were made up by a Board of Naval officers among whom I am informed was no medical man or other person having scientific knowledge of dietary matters on board ship. No attention is paid to climatic conditions. Pork and beans are given as often in Cuban waters as when near Boston. As a matter of fact the subject of diet is a very important one and I can only urge that it be given official consideration. That such consideration is necessary may be believed when I state that no fresh fruit or eggs are allowed in the ration. Also the ration of milk is one ounce per day of the condensed article. A ration with such omissions surely needs investigation.

A great improvement could be made in the manner of serving and preparing foods by increasing the galley capacity and the number of qualified cooks as well as the table service and place for eating.

The sailor man is no doubt peculiar and requires special study. For instance he refuses to drink cocoa on the ground that it constipates. He balks at any sausage, especially Frankfurters, and shows disgust by calling them "dog." He is very averse to stale or heavy bread and "cries bitterly" at the sight of hard tack. He objects strenuously to butterine, which he often gets despite the closest scrutiny of the purchasing Paymasters. Veal is all bad because it is "bob" and pork is never free from trichinae. Still the majority of them eat and grow fat, serve their time and seldom reenlist.

* * * * *

*A careful consideration of all the data at hand will show that with a fleet of battleships whose crews have been well shaken down, whose work is reasonable and where climatic extremes are avoided, the daily percentage of sick should not be over 87/100 per cent, whereas for the last four years the percentage has been 1-36/100 per cent.

The percentage figures look small and as a matter of fact are small, but when translated into sick men per day per year for four years they mean as follows for the four ships:

At 1-36/100 per cent:

Men on the daily sick list equals.....	37.26
Days loss to service in one year.....	13,599.00
Loss to service in dollars per year.....	18,132.00
Number sent to hospital, dead or invalided.....	244.00

At 87/100 per cent:

Men on the sick list per day.....	23.83
Days loss to service.....	8,697.00
Loss to service in dollars per year.....	11,597.00
Number sent to hospital, dead or invalided.....	146.90

Thus can be seen at a glance the plainly apparent benefit that would accrue from careful discrimination in the selection of the best cruising grounds and the amount of active steaming done; from improvements in ship construction and in interior discipline. But the above tables and figures do not show the permanently injured men who are discharged from the service time expired; who are discharged because of disability, or go to our hospitals, making a large number who go out into civil life still capable of propagating the species. A large number of these men are a burden to themselves or their friends and cannot but have a depreciating effect upon the strength and spirit of our race.

*An interesting discussion of the health conditions on board the *Kearsarge*, *Alabama*, *Illinois* and *Kentucky*, illustrated by elaborate graphic charts is omitted with much regret at the unavoidable necessity requiring it.—EDITOR.

THE MEDICAL OFFICER AND THE LINE—A REMINISCENCE.

By MAJOR R. S. WOODSON,
SURGEON IN THE UNITED STATES ARMY.

A MORE or less intimate association with thirty-one Commanding Officers during an unusually varied service at the most isolated and unhealthy posts in this country, Cuba and the Philippines, has taught me to rely upon their cordial support in all efforts toward the improvement of post sanitation.

With but two exceptions, most notable from their infrequency, my judgment has been deferred to on all questions affecting the health of the command, frequently by officers intolerant of advice on most questions of post administration.

In the light of modern research and advanced sanitation one of these exceptions constitutes a commentary upon the arrogance of self-sufficient egotism of the preceding decade, in frowning down upon all attempts of the Medical Staff Officer toward improved sanitation.

For years Fort Barrancas had occupied an unenviable position among subtropical posts for sickness and ineffectiveness. Malaria had long held full sway varied by frequent outbreaks of yellow fever. Many misdirected and impotent efforts toward the eradication of these two evils had been instituted by former responsible officers, such as the closing of all wells, the substitution of rain water cisterns, the migration of troops during the hot season to northern stations, etc., under the direction of such able Medical Officers as Major Geo. M. Sternberg and Captain W. C. Gorgas, their energetic efforts and frequent reports causing friction and calling forth caustic comment. One of these I shall mention as showing the spirit of opposition accorded these officers. The surgeon in a sanitary report remarked as follows:

"The commanding officer's attention is respectfully called to the existence of certain unsanitary conditions, etc." This was returned to the Post Surgeon (Captain Gorgas) with the following endorsement: "Respectfully returned to the Post Surgeon, Fort Barrancas, Fla., who will remove the objectionable phraseology contained herein. The Commanding Officer's attention may be requested but not called."

Our attention at that time was devoted to miasma, fomites, etc., while the ubiquitous anopheles and stegomyia were left in undisturbed security and in millions as to number. Just at this time while Post Surgeon of Fort Barrancas (my first independent post) I was struck by a report of Surgeon John W. Ross, U.S. Navy on duty at the adjacent Navy Yard, who attempted to prove that the mosquito was responsible for the prevalence of malaria at Barrancas and cited the fact that the soldiers occupying the third story of barracks not subjected to mosquito bites did not suffer from malaria.

Fort Barrancas is built upon a slight bluff (hence the name) immediately in front of which and extending to the bay is a stretch of swamp about two hundred yards in width, catching the surface drainage of the post and constituting a breeding place for countless myriads of mosquitoes, rendering the post almost uninhabitable. I observed that the Quartermaster and Commissary Departments and their personnel located in this swamp were all severely afflicted with malaria. Being imbued with the energy of youth but without the facilities for scientific research, I tried to prove that this swamp contributed greatly to the unhealthfulness of the garrison, and labored earnestly for a year by sanitary reports, drawings, plans and estimates to have this swamp drained. I am sorry to say that my efforts were met with ridicule and indifference on the part of the Commanding Officer and the Constructing Quartermaster, the latter of whom was wont to remark that "that swamp had about as much to do with the health of the post as that fire bucket full of stale water." As the fire bucket was probably a breeding place for mosquitoes in his quarters he spoke wiser than he knew, except in degree.

The Surgeon General approved of all my recommendations and sent a sanitary expert to consider the subject, but his efforts were overridden by the Commanding Officer and the Constructing Quartermaster, who by the way would have had to have drained the swamp. Finally some one in the Quartermaster General's Office in Washington informed me that the surface drainage of the post did not run into the swamp. It will always remain a mystery to me how this officer in Washington knew this, as all of us at Barrancas thought differently.

The second exception occurred at Panique, Luzon in 1900 when two companies of Infantry were ordered out for permanent garrison duty at a notoriously unhealthy locality called the "Wash out," afterwards abandoned. They left the post without medical attendant or supplies. As Regimental Surgeon I addressed the Adjutant as follows:

"I have the honor to report that I observed two organizations leaving the post this morning for permanent garrison at outlying posts, without medical attendant or supplies. I would respectfully request in future that I be notified of such changes in order that I may be able to furnish the necessary attendant and supplies."

This letter called forth the following reply from the Adjutant:

"The Commanding Officer directs me to inform you that whenever he deems a medical attendant necessary he will take such steps as will insure his presence."

The Chief Surgeon shortly received a field note from the Commanding Officer of the "Wash out" begging him "for God's sake" to send some medical supplies as his company was incapacitated by reason of sickness and he was without even a quinine pill.

These incidents mark the passing of a prejudice that future enlightened generations will not be able to understand.

REPORT OF PENETRATING GUN SHOT WOUND OF THE ABDOMEN, WITH NINETEEN PERFORA- TIONS, OPERATION WITH RECOVERY.

By JOHN HOOE IDEN, M.D.,

PASSED ASSISTANT SURGEON IN THE UNITED STATES NAVY.

NOBUTARA Miyamota, Cabin Cook, U.S.N., was admitted to this hospital at 10:25 p.m. July 31, 1905, from the U.S.S. *West Virginia* as with *Vulnus Sclopeticum*.

Hospital ticket read as follows: "patient was accidentally shot by a revolver in the hands of H. Tanabe, J. O. Cook, U.S.N., which he was handing to the patient after picking it up from the deck with other articles, which had fallen from an overturned ditty box. Penetrating wound of abdomen. Point of entrance about midway between right anterior superior spine of the ilium and the umbilicus." It was later ascertained that the accident occurred at 7:30 p.m.

Examination revealed a penetrating wound of abdomen, slightly above McBurney's point. Abdomen was distended and physical signs of fluid were present. Pulse was about 110 and of fair quality. Vomited very frequently. Strychnine Sulphate, gr. 1/30 had been given previous to this examination. Later, pulse became more rapid and weak. Face pale, and body bathed in cold perspiration. Frequent vomiting continued. Morphine Sulphate, gr. 1/4, and Strychnine Sulphate, gr. 1/30 were given.

As soon as it was known that patient was to be sent to this hospital, orders were given to prepare for operation in case it was deemed advisable.

According to statement of patient, the wound was made by a thirty-eight caliber pistol and at close range; later the pistol was examined and found to be thirty-two caliber.

At 12:40 a.m. ether was administered, abdomen scrubbed, and long medium incision made. Abdomen was found to be full of blood, though hemorrhage had apparently ceased. Omentum was congested and bullet wound plainly visible. Blood was removed from abdominal cavity with sterile gauze sponges. Beginning at the duodenum, the small intestines were rapidly examined and nineteen perforations found besides a number of wounds of the mesentery. At one place there were five perforations in about four inches of the gut, which necessitated resection. End to end anastomosis was done, using Cushing sutures. Other perforations were

closed by purse string sutures, first introduced by Dawbarn of New York. Wound in omentum was ligated with silk and injured part removed. Borders of wound in mesentery were inverted and closed with silk sutures. In examining the intestines it was impossible to avoid eventration, so they were covered with sterile gauze wet with hot salt solution.

From the location of the intestinal and mesenteric wounds, the bullet must have passed transversely through the abdomen, with a slightly upward and backward direction, and buried itself in the muscles of the back on the opposite side. On account of the grave condition of the patient, no attempt was made to locate it.

The intestines and abdominal cavity were hastily wiped with gauze, wet with hot saline solution. Intestines were replaced and abdominal wound closed with three rows of buried catgut sutures, and a superficial row of silk-worm gut.

During the operation, which was about two and one-half hours in duration, the patient's pulse became very rapid and weak in spite of frequent hypodermics of various stimulants. At the completion of the operation there was no perceptible pulse, but faint heart sounds were heard with stethoscope. Hot intravenous saline infusion was given to which patient reacted well, and at 6:00 a.m. pulse was 128 and of good volume.

Nothing was given per os for forty-eight hours, except a little cracked ice and brandy. Morphine Sulphate gr. $\frac{1}{4}$, given every four hours, and patient kept as quiet as possible. Temperature was 101 F., per rectum, and he rested well all day.

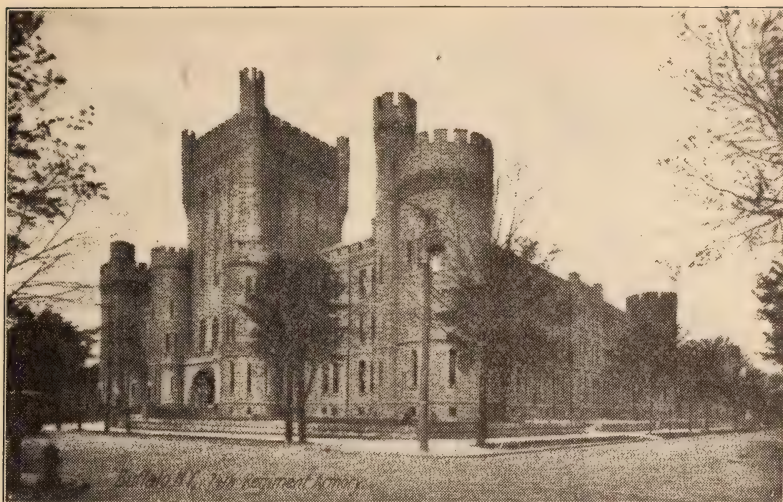
The following day, August 2nd, his highest temperature was 100 F., pulse 124. Vomited frequently; vomitus had distinct fecal odor.

August 3rd: Vomiting stopped. Temperature, per rectum 100 F., pulse 92 and strong. Had large soft stool; voided urine normally. Rested well and stated that he felt splendid. Milk and lime-water by mouth.

August 4th: Temperature and pulse normal. Bowels moved twice. From this on the patient improved rapidly. Wound practically healed by first intention, though there were one or two stitch abscesses.

On September 5th he had gained flesh and strength and was permitted to walk around, after applying an abdominal support. On September 20th, fifty-one days after the operation, he was sent to duty perfectly well. At his own request he was permitted to do light work in the hospital kitchen for ten days previous to discharge.

In conclusion it should be stated that the patient was under the anesthetic for fully three hours.



Armory of the 74th Regiment N. G. N. Y., at Buffalo.

The Fifteenth Annual Meeting, Buffalo, N.Y., September 11-14, 1906.

MINUTES OF THE MEETING.



UFFALO, N. Y., was the scene of the Fifteenth Annual Meeting of the Association of Military Surgeons of the United States, which convened at the Headquarters of the 4th Brigade N.G. N. Y., Tuesday morning, September 11, 1906, and continued in scientific session during the three ensuing days, with one day additional devoted to the cultivation of mutual acquaintance, the following officers, members and delegates being present.

OFFICERS.

- Brevet Lieutenant Colonel ALBERT HENRY BRIGGS, Surgeon in the National Guard of New York, *President*.
Major JAMES EVELYN PILCHER, Brigade Surgeon of U.S. Volunteers, Captain, Retired, U.S. Army, *Secretary and Editor*.
Major HERBERT ALONZO ARNOLD, Surgeon in the National Guard of Pennsylvania, *Treasurer*.
Assistant Surgeon WILLIAM COLBY RUCKER, Public Health and Marine Hospital Service, *Assistant Secretary*.

MEMBERS.

- Major Charles Adams, Surgeon Illinois N.G.
Major Henry Allers, Surgeon N. G. New Jersey.
Major Charles H. Andrews, Surgeon U.S. Volunteers.
Surgeon Preston H. Bailhache, P.H.&M.H.S.
Major George W. Barr, late U.S. Volunteers.
Captain Edwin L. Bèbee, Assistant Surgeon N.G. New York.
Surgeon William Hemphill Bell, U.S. Navy.
Major William G. Bissell, Surgeon N.G. New York.
Major General Robert A. Blood, Surg. Gen., Retired, of Massachusetts.
Acting Assistant Surgeon Henry Hobart Bradley, late U.S. Army.
Surgeon William C. Braisted, U.S. Navy.
Major Edward M. Brown, Surgeon Washington N.G.
Lieutenant Colonel Edmund Cone Brush, Chief Surgeon Ohio N.G.
Major Daniel S. Burr, Surgeon N. G. New York.
Surgeon Duncan A. Carmichael, P.H.&M.H.S.
Major Thomas E. Carmody, Surgeon N.G. Colorado.
Captain Horatio Chisholm, late Madras Staff Corps.
Major Thomas C. Clark, Surgeon, Retired, Minnesota N.G.
Captain Marshall Clinton, Assistant Surgeon N.G. New York.
Major Wilbur A. Conkling, Surgeon Iowa N.G.
Contract Surgeon Harold D. Corbusier, late U.S. Army.
Lieutenant Colonel Floyd S. Crego, Brigade Surg., Retired, N.G.N.Y.
Captain F. Elbert Davis, late Assistant Surgeon N.G. New York.
Major Howard S. Dearing, Surgeon, Massachusetts V.M.
Brigadier General William H. Devine, Surgeon General Mass. V.M.
Captain J. Carlisle DeVries, Assistant Surgeon N.G. New York.
Major William T. Dodge, Surgeon Michigan N.G.
Major Clarence E. Drake, Surgeon Ohio N.G.
Colonel John B. Edwards, Assistant Surgeon General Wisconsin N. G.
Major Franklin B. Entrikin, Surgeon Ohio N.G.
Major Thomas W. Evans, Surgeon Minnesota N.G.
Major David S. Fairchild, Jr., Surgeon Iowa N.G.
Captain Powell C. Fauntleroy, Assistant Surgeon U.S. Army.

Major Frederick Fenton, Surgeon Canadian A.M.S.
Lieutenant Colonel J. T. Fotheringham, Canadian A.M.S.
Lieutenant John Vernon Frazier, Assistant Surgeon Michigan N.G.
Major Edward H. Grannis, Surgeon Wisconsin N.G.
Acting Assistant Surgeon John H. Grant, late U.S. Army.
Captain Thomas Page Grant, late Assistant Surgeon Kentucky S.G.
Major Lovett T. Guerin, Surgeon Ohio N.G.
Major George H. Halberstadt, Brigade Surgeon, N.G. Pennsylvania.
Colonel Valery Havard, Assistant Surgeon General U.S. Army.
Major Eugene Hawkins, Surgeon Indiana N.G.
Lieutenant Julius F. Henkel, Chief Surgeon Michigan N.G.
Major Vernon J. Hooper, Surgeon Michigan N.G.
Lieutenant Colonel Charles S. Huffman, Deputy Surg. Gen. Kan. N.G.
Captain James B. Hungate, Assistant Surgeon Nebraska N.G.
Brevet Major Arthur R. Jarrett, Assistant Surgeon N.G. New York.
Lieutenant Colonel Nathan S. Jarvis, Brigade Surgeon N.G. New York.
Major James Johnston, Surgeon, Retired, N.G. Pennsylvania.
Major Homer I. Jones, Surgeon Indiana N.G.
Captain Vertner Kenerson, Assistant Surgeon N. G. New York.
Major James Wilson McMurray, Surgeon Ohio N.G.
Major E. L. Martindale, Surgeon Iowa N.G.
Captain Marcius H. Merchant, Rhode Island M.
Major John A. Metzger, Surgeon U.S. Volunteers.
Lieutenant Samuel A. Milliken, Assistant Surgeon New Mexico N.G.
Major Ralph W. Montelius, Surgeon N. G. Pennsylvania.
Captain Alfons Müller, Assistant Surgeon N. G. New York.
Colonel James B. O'Neill, Surgeon General of Maine.
Major Roswell Park, late Brigade Surgeon N. G. New York.
Captain George W. Pattison, late Asst. Surg. N. G. New York.
Lieutenant Robert H. Pretlow, Assistant Surgeon Virginia N. G.
Brigadier General William E. Putnam, Surgeon General of Vermont.
Colonel William J. R. Rainsford, Royal Army Medical Corps.
Lieutenant A. Avery Rittenour, Assistant Surgeon Virginia N. G.
Major Buell S. Rogers, Surgeon Illinois N. G.
Captain Jesse Rowe, Assistant Surgeon Illinois N. G.
Captain Nelson G. Russell, Assistant Surgeon N. G. New York.
Acting Assistant Surgeon A. R. Schier, U. S. Army.
Medical Director Walter Keeler Scofield, U. S. Navy, Retired.
Major Louis Livingston Seaman, Surgeon U. S. Volunteers.
Colonel Nicholas Senn, Surgeon General of Illinois.
Medical Director Manly H. Simons, U. S. Navy.
Lientenant Colonel Eugene A. Smith, Brigade Surgeon N. G. N. Y.
Lieutenant Colonel William A. Smith, Medical Director Mass. V. M.
Major Harry H. Snively, Surgeon Ohio N. G.
Captain Edward A. Southall, Assistant Surgeon U. S. Volunteers.

Captain Samuel Cecil Stanton, Assistant Surgeon Illinois N. G.
 Lieutenant Colonel Andrew S. Stayer, Division Surgeon N. G. Penna.
 Major Ralph W. Stewart, Surgeon Ohio N. G.
 Brigadier General Alexander J. Stone, Surgeon General Minnesota N. G.
 Acting Assistant Surgeon W. T. Thackeray, late U. S. Army.
 Lieutenant David M. Trecartin, Surgeon Naval Battalion Conn. N. G.
 Lieutenant J. Leland Van Gorden, Assistant Surgeon Iowa N. G.
 Lieutenant Colonel Wilbur S. Watson, Assistant Surg. Gen. Conn. N. G.
 Assistant Surgeon William F. Waugh, late U. S. Navy.
 Surgeon Charles P. Wertenbaker, P.H. & M.H.S.
 Major Allen A. Wesley, Surgeon Illinois N. G.
 Major Charles C. Wiley, Brigade Surgeon N. G. Pennsylvania.
 Acting Assistant Surgeon Nelson W. Wilson, late U. S. Army.
 Major James H. Wright, Surgeon Ohio N. G.
 Major George W. York, Surgeon, Retired, N. G. New York.
 Colonel Robert S. Young, Surgeon General of North Carolina.

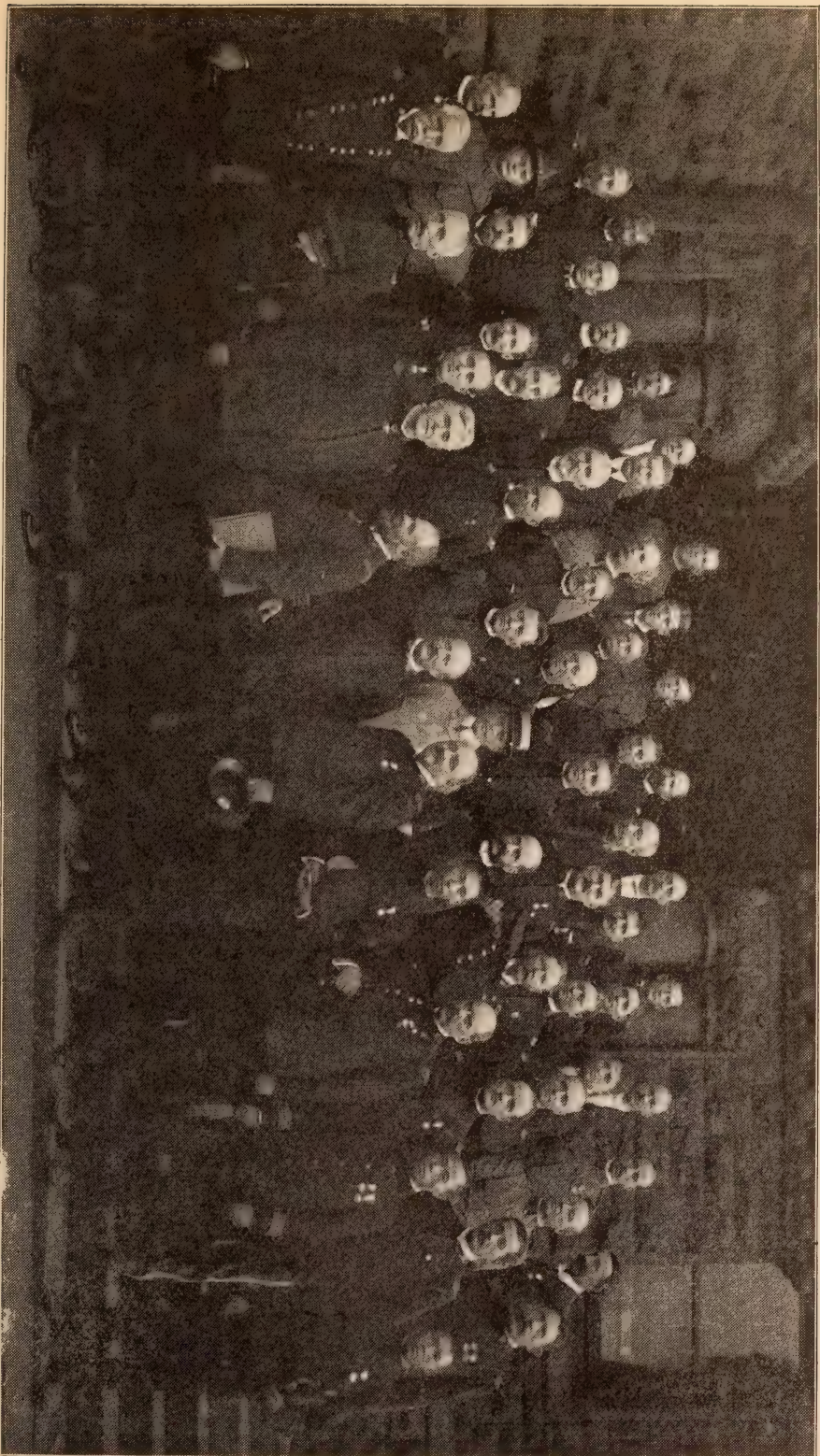
FOREIGN DELEGATES.

Colonel Ramon Bengoechea, Surgeon General of Guatemala.
 Captain Chou Kwai-Seng, Imperial Chinese Army
 Major William H. Delaney, Canadian A.M.S.
 Major William Henry Wilson Elliot, Indian Medical Service.
 Staff Surgeon Arthur Gaskell, Royal Navy.
 Captain Ho Kan Yuen, Chief Surgeon Chinese Navy.
 Lieutenant Colonel W. G. Macpherson, Royal Army Medical Corps.
 Colonel Henri Mareschal, French Army.
 Lieutenant J. Lisandro Medina, Nicaraguan Army.
 Lieutenant Colonel George Hugh Parke, Canadian A.M.S.
 Lieutenant Colonel Alejandro Ross, Mexican Army.
 Major Tchan Chi-hua, Imperial Chinese Army.

FIRST SESSION, TUESDAY MORNING, SEPTEMBER 11, 1906.

THE Fifteenth Annual Meeting of the Association of Military Surgeons of the United States was called to order by the President, Lieutenant Colonel Albert Henry Briggs, N. G. N. Y., Tuesday, September 11, 1906, at 10:10 a. m., at the Headquarters of the Fourth Brigade of the State of New York, in the German Insurance Building, at Buffalo, N. Y., which had been handsomely decorated with the flags of all nations, and most conveniently arranged for the work of the Association.

THE PRESIDENT, LIEUTENANT COLONEL A. H. BRIGGS.—We will commence the meeting without formalities this morning.



A Group of Members of the Association of Military Surgeons, Buffalo, N. Y., September 14, 1906.

We shall have the speeches of welcome this evening. I will only say that to you gentlemen from foreign lands sent as representatives of your governments, I desire, as President, to give a cordial and hearty welcome. We feel highly honored at the fact that you are sent to take part in our deliberations, and we will make it pleasant for you and give you the right hand of good fellowship.

THE SECRETARY then read the report of the EXECUTIVE COUNCIL approving the clause of disclaimer, published at the head of each number of the JOURNAL; directing the elimination of personalities from future publications in the JOURNAL; extending thanks to Majors Seaman and Sander for the prizes donated by them; reporting the election during the year of 101 Active and Associate Members; and recommending for election to Corresponding Membership of twelve, and to Honorary Membership of one candidate.*

Amendments to the Constitution and By-Laws were recommended to the consideration of the Association as follows: Introducing a grade of "Affiliated Membership" to provide for many persons interested in the work of the Association not entitled to full membership, such as United States Pension Examining Surgeons, medical officers of the United States Coast and Geodetic Survey, other government services, etc.; Affiliated Membership not to entitle its holders to hold office or to vote; and providing that Corresponding Members and Honorary Members shall report each year to the Secretary under penalty of suspension.

The change of the name of the JOURNAL to "THE MILITARY SURGEON" with the present title as a sub-title was recommended, and provisions were made for reference of papers to the Publication Committee, the establishment of the time limit, and the continuation of the Committee on Insignia.

On motion the report and its recommendations were adopted.

THE SECRETARY, Major JAMES EVELYN PILCHER, reported the continuation of the work of the Secretary's office without cessation and in increasing amount; the addition of 101 new

*Complete lists of these new members have appeared in the JOURNAL during the year, with the exception of those published in the News of the Services of the present issue.

members to the Association, chiefly from the National Guard; the receipt during the year of \$4,530.83, and the expenditure of \$4,364.15, leaving a balance of \$166.68 in the possession of the Secretary; the assumption and performance of the duties hitherto pertaining to the Transportation Committee; and the issue of some 60,000 pieces of printed matter during the year.

On motion the report was approved.

THE TREASURER, MAJOR HERBERT A. ARNOLD, reported the receipt during the year of \$3,543.93 and the expenditure of \$2,850.10, leaving a balance of \$693.83 to be added to \$5,461.72, the cash on hand at the beginning of the year, making a total of \$6,155.55 to be carried forward.

On motion the report was approved.

The following committee was appointed to audit the Secretary's accounts.

Colonel J. K. Weaver, N.G.Pa., Surgeon C. P. Wertenbaker, P.H.&M.H.S., and Surgeon W. C. Braisted, U.S.N.

To audit the Treasurer's accounts the following committee was appointed.

Colonel Valery Havard, U.S.A., Acting Assistant Surgeon W. H. Marsh, P.H.&M.H.S., and Major R. W. Montelius, N.G.Pa.

The report of the LITERARY COMMITTEE was then read by Assistant Surgeon W. C. Rucker, P.H.&M.H.S.

On motion, inasmuch as the Literary Committee had performed its work so well, a vote of thanks was extended to it.

Medical Director R. A. Marmion presented the report of the LEGISLATIVE COMMITTEE.

The Report of the COMMITTEE ON PERMANENT INTERNATIONAL CONGRESS OF MILITARY SURGEONS was made by Major James Evelyn Pilcher, U.S.V. who remarked: "Surgeon General Wyman the chairman, is not present, but as Secretary of the Committee I wish to make a brief report. It was thought wise upon consultation by letter that the second meeting of this congress should be held in Great Britain. Correspondence was had with Director General Keogh with a view to securing the co-operation of the British officials in this organization. It was

taken up and carefully considered, and after further correspondence through the British Embassy in Washington and the Royal Army Medical Corps in London, it was decided that for the present year they were unable to undertake it. It is hoped that the foreign delegates will emphasize in their reports that an International Congress should meet next year in Great Britain."

Lieutenant Colonel W. G. MACPHERSON, R.A.M.C.—We are not quite prepared. We heartily sympathize with the idea, but are not in a position to go so far.

The report was accepted.

The Report of the COMMITTEE OF ARRANGEMENTS, was briefly outlined by the President.

The Report of the NECROLOGY COMMITTEE was read by Captain S. C. Stanton, I.N.G., and upon motion by General Senn, it was adopted by a rising vote.

Specific reports were included upon Surgeon Cyrus Tracy Peckham, P.H.&M.H.S.; Colonel Samuel E. Bibby, Idaho N.G.; Captain William Anderson Burns, O.N.G.; Dr. Ezra Herbert Wilson; Dr. James William Holland, U.S.A.; Brigadier General George Ryerson Fowler, N.G.N.Y.; Lieutenant Jeremiah Augustine Cronin, M.V.M.; Brigadier General Charles Henry Alden, U.S.A.; and Medical Director George Peck, U.S.N.

Report of the COMMITTEE ON THE ENKO SANDER PRIZE MEDAL: Colonel J. K. WEAVER announced that the Board had decided that the paper submitted by "Solus" wins the prize.

On opening the envelope it was found that "Solus" was Major James Evelyn Pilcher, U.S.V. (Prolonged Applause).

THE PRESIDENT, Lieutenant Colonel BRIGGS.—"The Association congratulates you, Major Pilcher."

Major James Evelyn Pilcher, U.S.V., then read a twenty minute abstract of the essay on "The Training of the Medical Officer of the State Forces to Best Qualify Him for Local Service and for Mobilization with National Troops," to which the gold medal had been awarded, which was discussed by Major Arthur R. Jarrett, N.G.N.Y., Captain A. Müller, N.G.N.Y., and the author.

THE PRESIDENT.—Major Sander is not here. As President of the Association I have the pleasure and honor of presenting to the winner the prize which has been won by our Secretary.

Major JAMES EVELYN PILCHER, U.S.V.—I feel deeply the honor of receiving the award of this prize, and particularly in connection with a subject so important as that of this year's competition. I shall wear the medal with pride at the future meetings of the Association.



Lafayette Square, Buffalo, N. Y.

The Lafayette Hotel is immediately in rear of the Soldiers and Sailors Monument, and the diagonal path from that point to the foreground of the picture was the route from the Hotel to the German Insurance Company Building, on the fourth floor of which the meetings were held.

Major THOMAS C. CLARK of Minn.—I move that a copy of this essay be sent to every commanding officer of every National Guard regiment, brigade and division in the United States, and that it be sent to the respective Adjutants General of the several States for distribution. Carried.

Lieutenant Colonel N. S. JARVIS, N.G.N.Y.—Last winter one of the pioneer members of this Association met with a painful accident and lost his right leg. I refer to Lieutenant Colonel

Leonard B. Almy of Connecticut, and wish here to introduce the following resolutions:

Whereas: The hand of misfortune has fallen heavily upon our beloved colleague Lieutenant Colonel Leonard B. Almy of Connecticut, one of the pioneers of this Association—

Therefore it is Resolved: That our profound sympathies are extended to Colonel Almy and our admiration for the patience and courage with which he has borne his great trial and our earnest wishes for his convalescence and preservation.

And it is further Resolved: That this resolution be entered on the minutes at this meeting and that a copy be telegraphed by the Secretary to Colonel Almy.

A letter from Colonel Almy was here read by Assistant Secretary W. C. Rucker. The resolution prevailed by a rising vote.

THE PRESIDENT.—I have here a cablegram from Mrs. John Miller Horton, Regent of the D. A. R., sending her good wishes to the Association.

The meeting then adjourned at 11:50 a. m.

SECOND SESSION, TUESDAY AFTERNOON, SEPTEMBER 11.
1906.

THE meeting was called to order by the President, Lieutenant Colonel Briggs, at 2:20 p. m.

A paper entitled "Notes on the Russian Red Cross; by Colonel Valery Havard, U.S.A., was read.

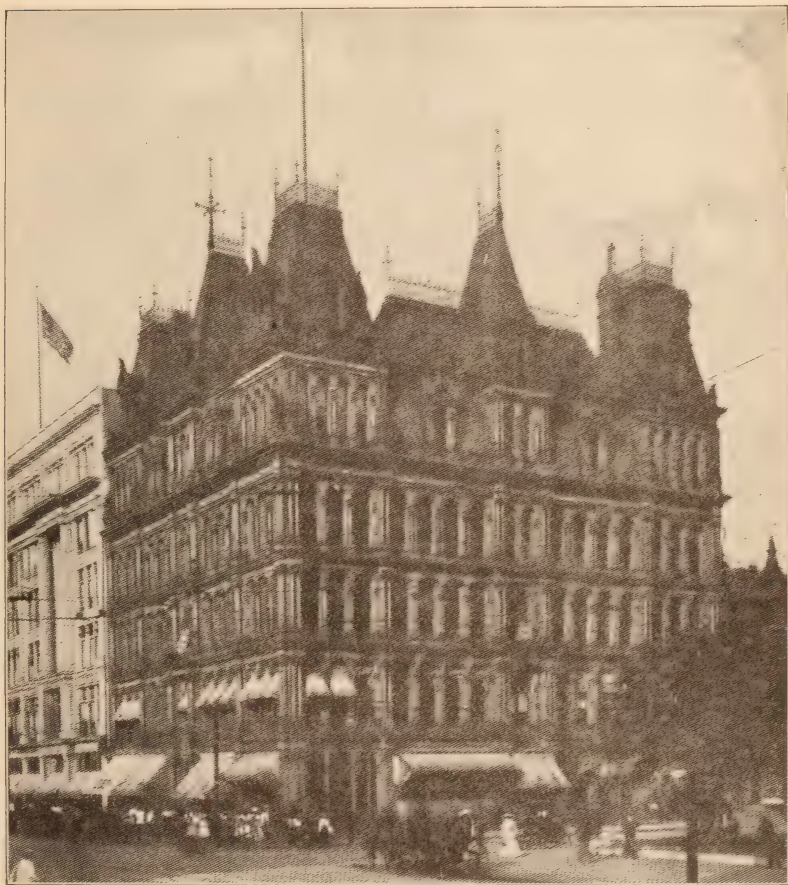
A paper then followed upon "Tendon Tissue versus Catgut," by Colonel Nicholas Senn, Ill.N.G., which was discussed by Staff Surgeon Arthur Gaskell, R.N., Major W. H. W. Elliot, Indian Medical Service, and the author.

A paper was then read upon "Hand and Instrument Disinfection," by Captain J. Carlisle De Vries, N.G., N.Y., and discussed by Major Henry Allers, N.G.N.J., Dr. H. D. Corbusier, U.S.A., Lieutenant J. Lisandro Medina, Nicaraguan Army, Major T. E. Carmody, N.G.Colo., and the author.

A paper entitled, "Clinical Report of the Use of Yeast in Genito-Urinary Work and Gynecology," was read by Captain Thomas Page Grant, Ky.S.G., and discussed by Captain Powell C. Fauntleroy, U.S.A.

The following papers were then read by title and referred to the Publication Committee:

Further remarks on, and Care of Gunshot Wounds of the Abdomen, with Special Reference to the Treatment of Such



The German Insurance Building, Buffalo, N. Y.

In the Headquarters of the Fourth Brigade, N. G. N. Y., occupying the Fourth Floor of this Building, the Meetings of the Association were held.

Wounds of the Urinary Bladder. By Former Assistant Surgeon General George Tully Vaughan, P.H.&M.H.S.

Some French Impressions of the Surgery of the Russo-Japanese War. By Captain C. S. Butler, M.V.M.

A Geometrical Cyrtometer for the Easy Application of Chi-pault's Method of Cranio-Cerebral Localization. By Surgeon W. H. Bell, U.S.N.

The Brain a Good Field for Surgery, as Shown by Its Disregard for Traumatism. By Captain C. D. Center, Ill.N.G.

Surgical Treatment of Dysentery. By Surgeon H. C. Curl, U.S.N.

Wounds of the Colon Treated without Operation. By Major P. R. Egan, U.S.A.

The Use of Mercurial Bichloride in Surgery. By Acting Assistant Surgeon, M. W. Houghton, P.H.&M.H.S.

The Classification and Treatment of Burns. By Surgeon C. P. Kindleberger, U.S.N.

Firing Tests and Experiences with the Small Caliber Rifle. By Generalarzt Dr. A. Körting.

A Case of Multiple Gunshot Wound. By Lieutenant L. T. LeWald, U.S.A.

Fractures of the Spine. By Surgeon W. P. McIntosh, P.H. & M.H.S.

Surgery at the First Aid Station. By Colonel H. Nimier, French Army.

A Case of Fracture of the Skull. By Captain S. M. Waterhouse, U.S.A.

The Results of a Year's Surgical Work in the Old Cavite Hospital. By Passed Assistant Surgeon U. R. Webb, U.S.N.

It was moved and seconded that a vote of thanks be tendered to Mrs. John Miller Horton for her handsome gift of flowers ordered by cable from France. Carried.

Colonel VALERY HAVARD, U.S.A.—There is here a representative of the Colt Acetylene Light Co. At the suggestion of the Surgeon General of the Army he has brought here a search-light for the battlefield, to collect the wounded at night. It throws a beam of bright light upon the battlefield. He also has

a smaller searchlight to fasten to the cap of the Hospital Corps men. With the assent and approval of the President, it is proposed to proceed to Fort Porter at 9:30 p. m., Thursday night to witness the demonstration.

The meeting adjourned at 5:20 p. m.

THIRD SESSION, PUBLIC MEETING, TUESDAY EVENING,
SEPTEMBER, 11, 1906.

THE meeting was called to order at 8:30 p. m. in the Auditorium of the Young Men's Christian Association, by Major Herbert P. Bissell, N.G.N.Y., Chairman of the Committee of Arrangements, the officers of the Association, foreign delegates and distinguished guests seated upon the stage. Music was furnished by an orchestra, during the course of the evening.

After the Overture the Invocation was offered by Chaplain George B. Richards, N.G.N.Y.: Our Father who art in Heaven, hallowed be thy name, thy Kingdom come, thy Will be done, on Earth as it is in Heaven. Give us this day our Daily Bread and Forgive us our Debts as we forgive our Debtors. Lead us not into Temptation, but deliver us from Evil, for Thine is the Kingdom and the Power and the Glory, for Ever and Ever, Amen.

Direct us in all our things with Thy most gracious favor, and favor us with Thy help, that we may Glorify Thy Holy Name, and Obtain Everlasting Life, through Jesus Christ, Amen.

Major Herbert P. Bissell then made an interesting introductory address.

Hon. Louis P. Fuhrman, Acting Mayor of Buffalo, followed with a welcome to the Association on behalf of the Queen City of the Lakes.

Major Roswell Park, Professor of Surgery in the University of Buffalo, made a scholarly address on behalf of the medical profession of the city.

Hon. Roland B. Mahaney, extended to the Association a cordial welcome on behalf of the State of New York.

The President, Lieutenant Colonel Albert H. Briggs, then responded in eloquent and fitting terms.

DECORATION OF THE FOREIGN DELEGATES.

The meeting closed with the decoration of the foreign delegates on behalf of the Association, by Major James Evelyn Pilcher, the Secretary, who remarked :

For at least a decade it has been customary for this Association to invite representatives of the military medical services of foreign countries. We have endeavored to extend to them all the courtesies of our organization and to open wide the gates of our military medicine and surgery to them. During this period we have had the pleasure of entertaining representatives from many parts of the world. The Association of Military Surgeons has extended in this way, its influence, until now it may be truly said that the sun never sets upon the Association of Military Surgeons. During every hour of the day some member is rendering service to his military associates. Our work extends from the southland to the Arctic Circle. I have been in the habit of saying that in the medical department there is no war. There may be war between nations and countries, the map of the world may be entirely modified, but military surgeons are always friends and laboring together in the same good cause. In recognition then of this fact, the Executive Council of the Military Surgeons at its meeting last night extended to the representatives of foreign governments, who have not heretofore been accorded that honor, the honor of election to corresponding membership. Our delegate from France has been with us for three and our representative from Mexico for two meetings. From China we have the Surgeon General of the Navy who came also last year.

Lieutenant Colonel William Grant Macpherson, R.A.M.C., we have known so kindly the Royal Army Medical Corps of that ever great English speaking nation which never sees the sun set upon its possessions that we have especial pleasure in receiving you as its accredited representative. We appreciate the unfailing courtesy your War Office has extended to us, and it gives us great pleasure to present to you this diploma of corresponding membership and this insignia which we trust you will wear upon your breast.

Staff Surgeon Arthur Gaskell, R.N., Naval Officers are favorites throughout the world, and there is especial reason for honoring the medical officers of that great service which has done so much since the time of the great Armada when her seamen protected the coasts of England from an attacking enemy. We understand the high standing of the British sailor. Wherever civilization is, British sails dot the sea. It is with particular happiness then that I have the pleasure of handing you this diploma of corresponding membership and this insignia, which we trust you will wear in remembrance of the pleasure your presence has given us.

Colonel Ramon Bengoechea, the American Continent is gradually expanding in the matter of civilization, and we have had the pleasure on a number of occasions of having among us gentlemen from Latin American nations along our southern borders. We have with us a gentleman who has represented Mexico on two occasions, and who is an honored corresponding member. We have tonight the pleasure of indicating the election to corresponding membership of the Surgeon General of Guatemala, Colonel Bengoechea. By the new relations acquired with the canal strip, we feel there should be a brotherhood between ourselves and you who dwell on the borders of that great waterway, and that there should be friendly relations between us at all times. I have pleasure then in handing you this diploma of membership and the insignia, which we trust you will wear as an indication of the high honor in which we hold your people.

Lieutenant J. Lisandro Medina, there is still another country that is to be numbered among those which our new international relations have brought to our doors, and that is Nicaragua. Dr. Medina who comes to us as a representative of his great country, and who wishes not only to receive the honors, but to extend to the United States and to the Surgeons of the United States the kind greetings of his country, is an honored guest to whom I have much pleasure in handing this diploma and insignia.

Major W. H. W. Elliot, I.M.S., sometimes I think when I talk of the Great British Empire that the subject is almost too

large for my inadequate tongue, particularly when I realize that the people of a little island in the Atlantic went to the Orient, subdued with hardly more than a corporal's guard the peoples of India and brought civilization out of chaos. We appreciate highly the splendid Indian Medical Service and in recognition of the noble work its members have done, I have particular pleasure in extending to you this diploma of corresponding membership and this insignia which I hope you will wear in our honor.

Major Tchan and Captain Chou, there has been in the world a great birth, a mighty re-awakening from a sleep of centuries. A slumberous State is stretching its arms forth to higher things. There are things in the great west she realizes that may be of service to her, and in her search for them we may look forward to the fact that the Occident may yet have a rival in the Orient which may endanger our own prestige in the world of nations. These gentlemen are representatives from China where they are developing an army medical corps according to western ideas. We have very great pleasure in including them among our corresponding members. We look forward to the time when your service shall be one of the greatest in the world. We trust we may long have the pleasure of including you as honored correspondents, and that these diplomas and insignia may be a perpetual reminder of the friendship of American Military Medicine for that of the Celestial Empire.

Lieutenant Colonel George Hugh Parke and Major William H. Delaney, Canadian A.M.S., I have again to recur to the "old, old story," not the one told over the garden gate with sweet nothings, but the tale of the British Empire and what is being done by English speaking people, whose King we respect, and whose people we honor. Just across the way we have a great dominion which has practically no standing army, for it needs no defense against us, the only nation its borders touch upon. We are glad to extend to you tonight the hand of neighborliness. We have no fear that across our boundary line there shall ever be extended aught but the cordial hand of good fellowship, and we have pleasure in conferring upon you the diploma of membership and this insignia as an indication of the great honor we

feel that your country has done in sending you to us for mutual help and advice, so that should there ever come war both will be better prepared. Blood is thicker than water and we cannot forget that should a conflict come between the peoples of the world we should be held together in potential might by a bond of brotherhood which we trust will ever remain firm and strong.

Lieutenant Colonel PARKE,—On behalf of my country I thank you. We shall always wear the insignia with feelings of the deepest gratification.

Major PILCHER.—This annual ceremony of decorating the foreign representatives means more than I have been able to say. It sounds the note of the new attitude of warring nations toward one another. It emphasizes the peaceful regard in which all armies today hold the ill and injured. It presages the dawn perhaps of a higher age when bloody conflict shall be replaced by pacific arbitrament. In the spirit of universal brotherhood and with sentiments of mutual respect and reciprocal courtesy we welcome our guests to our homes, our hearts and our work.

FOURTH SESSION, WEDNESDAY MORNING, SEPTEMBER
12, 1906.

THE meeting was called to order by the President, Lieutenant Colonel Briggs, at 10:15 a.m.

A paper was read upon "The Influence of Professor Burggraave upon Modern Therapeutics, with Especial Reference to Military Practice," by Dr. W. T. Thackeray, formerly U.S.A., and discussed by Dr. W. F. Waugh, formerly U.S.N. and Medical Director M. H. Simons, U.S.N.

This was followed by a paper on "Identification by Finger Prints," by Surgeon Charles Pondexter Wertenbaker P.H. & M.H.S., which was discussed by Major H. A. Arnold, N.G.Pa., Lieutenant Colonel W. G. Macpherson, R.A.M.C., Colonel V. Havard, U.S.A., Lieutenant Colonel N. S. Jarvis, N.G.N.Y. and Captain P. C. Fauntleroy, U.S.A.

A demonstration of a Mountain Litter was then given by Colonel Henri Mareschal, French Army, with a description read

by Colonel Valery Havard, U.S.A., and discussed by Major W. H. W. Elliot, I.M.S.

A Self Retaining Retractor for Use During Abdominal or Other Operations, was demonstrated and shown by Major Charles Adams, Ill. N.G.

The session closed with the reading of a paper upon "Splenic Abscess as a Not Uncommon Complication of Grave Malarial Infection," by Surgeon William Hemphill Bell, U.S.N.

The following papers were read by title and referred to the Publication Committee.

Defective Vision as a Cause of Rejection for Military Service. By Captain E. L. Ruffner, U.S.A.

Febrile Icterus in Port Townsend. By Surgeon W. G. Stimpson, P.H.&M.H.S.

Report of an Epidemic of Cerebro-Spinal Meningitis at the U.S. Naval Training Station, Newport, R.I., with a Discussion of the Disease in Relation to Military Establishments. By Surgeon N. J. Blackwood, U.S.N., Surgeon M. S. Guest, U.S.N., Passed Assistant Surgeon J. H. Iden, U.S.N. and Passed Assistant Surgeon J. L. Neilson, U.S.N.

Infantile Scorbutus Presenting Pseudo-Paralysis as the Predominating Symptom. Report of a Case occurring in the Philippines. By Captain W. P. Chamberlain, U.S.A.

A Study of West Indian Bilharziosis. By Passed Assistant Surgeon R. C. Holcomb, U.S.N.

The Opportunities afforded by the Military Medical Services for Applying Statistical Methods in Therapeutics. By Surgeon W. F. Arnold, U.S.N. Retired.

There being no further business, the meeting adjourned at 12:15 p.m.

FIFTH SESSION, WEDNESDAY AFTERNOON, SEPTEMBER
12, 1906.

THE meeting was called to order by the President, Lieutenant Colonel Albert H. Briggs at 2:55 p. m., when the following Nominating Committee was selected by the various states and services and directed to meet at 8:00 p.m. in the parlor of the Lafayette Hotel.

REPRESENTATION ON THE NOMINATING COMMITTEE.

Army.....	35	votes, Captain P. C. Fauntleroy.
Navy.....	18	" Medical Director M. H. Simons.
P.H.&M.H.S.....	19	" Surgeon D. A. Carmichael.
Colorado.....	1	" Dr. H. D. Corbusier.
Connecticut.....	2	" Lieutenant D. M. Trecartin.
Illinois.....	5	" Captain S. C. Stanton.
Indiana	1	" Major H. I. Jones.
Iowa.....	1	" Major D. S. Fairchild, Jr.
Kansas.....	1	" Lieut. Col. C. S. Huffman.
Kentucky.....	1	" Captain T. Page Grant.
Maine.....	1	" Colonel J. B. O'Neill.
Massachusetts.....	4	" Major H. S. Dearing.
Michigan.....	1	" Lieut. Col. J. F. Henkel.
Minnesota.....	1	" General A. J. Stone.
Mississippi.....	1	" Captain J. T. McLean.
Nebraska.....	1	" Captain J. B. Hungate.
New Jersey.....	1	" Major H. Allers.
New Mexico.....	1	" Lieutenant S. A. Milliken.
New York.....	7	" Lieut. Col. N. S. Jarvis.
Ohio.....	3	" Major C. E. Drake.
Pennsylvania.....	4	" Lieut. Col. A. S. Stayer.
Rhode Island.....	1	" Captain M. H. Merchant.
Vermont.....	1	" General W. E. Putnam.
Virginia.....	1	" Dr. C. P. Wertenbaker.
Washington.....	1	" Major E. M. Brown.
Wisconsin.....	1	" Colonel J. B. Edwards.

The scientific work was opened by a paper on "The Technique of A Yellow Fever Campaign," by Assistant Surgeon William Colby Rucker, P.H. & M.H.S., which was discussed by Colonel W. J. R. Rainsford, R.A.M.C., and Captain P. C. Fauntleroy, U.S.A., and a resolution was unanimously adopted urging its early publication in the JOURNAL and suggesting that it be reprinted and widely circulated by the government.

A paper entitled "Where Treatment of All Infected is the Surest Prophylactic Measure—the Problem of Epidemic Uncinariasis in Porto Rico," by Captain Bailey K. Ashford, U.S.A., was then read for the author by Captain P. C. Fauntleroy, U.S.A., and discussed by Major Herbert A. Arnold, N.G. Pa.

A paper entitled, "Natural versus Mechanical Ventilation of Hospitals," was then read by Surgeon Preston H. Bailhache,

P.H. & M.H.S., and discussed by Medical Director Manly H. Simons, U.S.N.

"An Economical Plan for a Consumptive Sanatorium with Description of a New 'Tent House,' " by Surgeon Paul M. Carrington, P.H. & M.H.S., and Acting Architect J. Ross Thomas, P.H. & M.H.S., was then demonstrated by Assistant Surgeon W. C. Rucker, P.H. & M.H.S.

"A Report of two Cases of Apparent Death from Drowning, Showing the Efficacy of Prolonged Artificial Respiration," by Assistant Surgeon John W. Trask, P.H. & M.H.S., was then read for the author by Assistant Surgeon W. C. Rucker, P.H. & M.H.S.

A discussion of "The Medical and Sanitary Questions Met in Everyday Life on a Cruising Ship of the Navy," was then presented by Medical Director Manly H. Simons, U.S.N.

"A Sanitary Scuttle Butt," by Surgeon M. F. Gates, U.S.N. was then demonstrated by Surgeon W. C. Braisted, U.S.N., who remarked: It is unfortunate that so few of our corps are able to be present. We have a large number of interesting papers but only a few of us can be here. However, most of those you will get in the proceedings without trouble.

The old way was to drink from casks aboard ship and diseases were communicable. It has been our attempt to try to limit this in some way. The most frequent thing in use was a supply of formaldehyde on hand to wash out the cup after drinking. We all drink distilled water aboard ship. The principle of this butt is the bubbling spring, and the drinker does not touch any part of it and there is thus no danger from infection.

The following papers were read by title and referred to the Publication Committee.

The Load of the Foot Soldier. By Colonel Henri Mareschal, French Army.

Tuberculosis in the Military Service. By Major G. E. Bushnell, U.S.A.

Milk and Coffee Extract and its use in the Russian Army. By Dr. W. F. de Niedeman, U.S.A.

The Steam Blast as a Mosquitocide. By Passed Assistant Surgeon T. D. Berry, P.H. & M.H.S.

Some New Culicides. By Passed Assistant Surgeon E. Francis, P.H. & M.H.S.

English, German and French Conceptions of Prophylaxis in East Africa. By Major H. S. T. Harris, U.S.A.

The Seaman as a Patient. By Passed Assistant Surgeon C. H. Lavinder, P.H. & H.M.S.

Notes on Recruiting. By Major H. I. Raymond, U.S.A.

Tropical Hygiene in Reference to Clothing, Houses, Routine and Diet. By Passed Assistant Surgeon A. Stuart, U.S.N.

There being no further business, the meeting adjourned at 5.00 p.m.

SIXTH SESSION, THURSDAY MORNING, SEPTEMBER, 13, 1906

THE meeting was called to order at 10.00 o'clock a.m., by the President, Lieutenant Colonel Albert H. Briggs, and the first paper of the morning was:

"The Soldiers' Ration in Camp," by Major Louis L. Seaman, U.S.V.E., which was earnestly discussed by Lieutenant Colonel W. G. Macpherson, R.A.M.C., Lieutenant J. L. Medina of Nicaragua, Dr. H. D. Corbusier, U.S.A., Lieutenant Colonel N. S. Jarvis, N.G.N.Y., Major W. H. W. Elliot, I.M.S., Assistant Surgeon W. C. Rucker, P.H. & M.H.S., Captain J. B. Hungate, Neb.N.G., and Lieutenant Colonel Floyd S. Crego, N.G., N.Y.

THE ARMY MEDICAL SCHOOL.

Colonel VALERY HAVARD, U.S.A.—In order that we may know all about beri beri our medical officers should be instructed, and I wish at this time to call your attention to our medical school. It is intended for those young men who wish to enter the medical corps of the army, and also for such medical officers of the National Guard who desire to avail themselves of it. It was established by Congress. It is housed in the building of the Surgeon General's Library and Museum. The object of this school is to

give the student a postgraduate course, to fit him for the many special duties devolving upon him in the camp and in the field. The curriculum includes military and tropical medicine, military surgery and hygiene, litter and ambulance drill, bacteriology and other allied subjects. Bacteriology receives especially full treatment. Probably our bacteriological course is one of the most complete given in an educational establishment in this country. Our friends of the National Guard in attendance have been too few,—only one last year and two have been admitted for this year. It is a great disappointment, because we can help them and they can help us. We want to bring our good work more prominently before the public. We want them to know the work we are doing. That object will be attained more readily if we have a certain number of National Guard officers who would then go home and tell all about us. Of course, there are difficulties. Few men can leave their practice and homes for eight months of the year, but for a certain number of the National Guard, the advantages would outweigh the disadvantages, and we might get a certain number of them. I sincerely hope so. As this matter is in the interest of the service and in the interest of the whole country, I ask for your cordial co-operation in the matter, and ask you to send us as many suitable men as you can. The course begins October 1st and ends in April. Each National Guard officer is entitled to one dollar a day subsistence and the commutation of quarters his rank calls for, and he receives mileage from and to his home. Anybody who wishes information should write to the Secretary of the School for details.

Major THOMAS C. CLARK, Minn. N.G.—At the 1892 meeting of this association, I had the honor to serve on a committee to present resolutions bearing upon this subject. They were presented, and it was felt strongly that the government should admit National Guard officers to the Army Medical School, and the idea was that officers of the National Guard would take advantage of such an opportunity. The government now has such a school but there is no result. We felt then that it was a proper training for National Guard officers. This Association deserves the credit for its adoption. I am also informed that our navy is unable to

get a sufficient number of young men to properly equip our ships, and our friends of the navy ask us as members of the National Guard to induce suitable young men to take into consideration the medical service of the navy. That is one of the functions of this society, to render as much assistance as we can in obtaining bright and intelligent young men for the medical service of our navy and army.

Captain J. B. HUNGATE, Neb. N.G.—In 1904 I wanted to go to the Army Medical School. I prepared my house, got everything in readiness and at St. Louis learned that I was too old a man to learn anything more. I have not lost my hope yet. I wish the society could do something to allow a man of forty-six to learn.

A paper upon "Korsakoff's Syndrome, its Ordinary Hospital Treatment," was then presented by Lieutenant Colonel Floyd S. Crego, N.G.N.Y.

The following papers were read by title and referred to the Publication Committee.

Recent Observations on Practical Camp Sanitation with Mobilized Troops in Field and Semi-Permanent Camps. By Lieutenant Colonel Louis M. Maus, U.S. Army and Captain W. J. L. Lyster, U.S. Army.

The work of the Hospital Corps of the Oregon National Guard at the San Francisco Disaster. By Captain William E. Carl, Oregon N.G.

The United States Marine Hospital at San Francisco in the Great Earthquake and Fire of 1906. By Surgeon Henry W. Sawtelle, P.H. & M.H.S.

The Sanitary Department of the Russian Armies in the Far East,—Its method of Evacuation of the Sick and Wounded. By Colonel John Van Rensselaer Hoff, U.S. Army.

The Military Medical Department in the South West African Uprising of 1904-1905. By Stabsarzt Dr. Kuhn, German Army. Translated by Lieutenant George J. Ogden, U.S. Army.

Experiences with the New York Volunteer Cavalry during the Spanish-American War. By Captain Medwin Leale, N.G.N.Y.

The Work of the Medical Department at Camp Roosevelt.
By the Medical Officers on Duty at the Camp of Instruction.

The Workings of the Ancon Hospital, Isthmus of Panama.
By Major John L. Phillips, U.S. Army.

The Bravery of the Medical Officer. By Major James Evelyn
Pilcher, U.S.V., Captain U.S. Army.

A First Aid Splint Packet. By Surgeon Raymond Spear,
U.S. Navy.

Note on the Military Medical Service of the Teutonic Order.
By Stabsarzt Dr. Johann Steiner, Austro-Hungarian Service.

Note on the Sanitary Condition of the Imperial Japanese
Army during the Late Russo-Japanese War. By Surgeon Gen-
eral Shigemichi Suzuki, Imperial Japanese Navy.

The Medical Officer and the Line—A Reminiscence. By
Major R. S. Woodson, U.S. Army.

There being no further business the meeting adjourned at
12.35 p. m.

SEVENTH SESSION, THURSDAY AFTERNOON, SEPTEMBER
13, 1906.

THE afternoon session of Thursday was called to order by
the President, Lieutenant Colonel Briggs, at 2:45 p. m.

The first paper was upon "A Sanitary Canteen," with
demonstration of a new device, by Dr. Harold D. Corbusier, late
U.S.A., which was discussed by Lieutenant Colonels A. H. Briggs,
N.G.N.Y., and W. G. Macpherson, R.A.M.C.

A paper upon "Surgical Shock," was read by Dr. J. L. Me-
dina, Nicaragua, and discussed by Capt. A. A. Rittenour, Va. N.G.

"A Military Medical Chest for Use on Mountainous Roads,"
was presented, described and discussed by Lieutenant Colonel
Alejandro Ross, Mexican Army.

"Some Statistics from Recent Military Operations," supple-
mentary to his paper read at the morning session, were then pre-
sented by Major Louis L. Seaman, U.S.V.E., and discussed by
Lieutenant Colonel W. G. Macpherson, R.A.M.C., Lieutenant
Colonel N. S. Jarvis, N.G.N.Y., and Dr. W. T. Thackeray, U.S.A.

Some New First Aid Packets were then demonstrated by Major George H. Halberstadt, N.G. Pa.

The following papers were read by title and referred to the Publication Committee.

The First Motor Ambulance, United States Army. By Captain Clyde S. Ford, U.S. Army.

A Case for the Chemical Analysis of Water in the Field. By Major Edgar F. Sommer, Indiana N.G.

Equipment of a National Guard Field Hospital. By Lieutenant Colonel Eugene A. Smith, N.G.N.Y.

A Consideration of Recent Views on the Work of the Medical Department in Naval Warfare. By Medical Director John Cropper Wise, U.S. Navy.

Laboratory Work Aboard Ship. By Passed Assistant Surgeon Alfred William Balch, U.S.Navy.

Proposal for a National Medical Service or Department of Public Health. By Surgeon Sheldon Guthrie Evans, U.S. Navy.

A New Field Latrine which fulfills the Requirements for Troops in Active Service where such Device is Necessary. By Captain Frederick C. Herrick, Ohio N.G.

A Description of an Electric Incubator for use aboard Ship. By Passed Assistant Surgeon Richmond C. Holcomb, U.S. Navy.

THE ARMY MEDICAL REORGANIZATION BILL.

General ALEXANDER J. STONE, Minn. N.G.—I desire to call the attention of the members present, representing the National Guard, to the army medical bill now pending in Congress. This is a matter of perhaps as much importance to us as any we have been engaged with for the last three years. You all know that President Roosevelt in two messages, and the Secretary of War still more frequently have recommended the passage of the bill. The bill presented to Congress has twice passed the Senate. Each time the Speaker of the House refused to allow it to come up and tabled it. The bill has now again passed the Senate. It will again come up before the House next winter with the Speaker's permission, and all influence that it is possible to bring to bear through our members of Congress should be invoked. It is our

duty to see that influence is brought to bear that will assure its passage. A majority of the members of the House are in favor of it, and if we can once get the Speaker's consent it will become a law. It increases the number and grade, emoluments and power of the medical officers of the army, and it is the duty of each one of us individually to keep up the work and bring all the influence we can bring to bear on Speaker Cannon as a matter of duty.

The Report of the Auditing Committee on the Secretary's accounts that they were correct, was adopted, as was a similar Report of the Auditing Committee on the Treasurer's accounts.

The Nominating Committee reported, recommending as the officers for the year 1906-1907 the following:

President: Colonel VALERY HAVARD, U.S.A.

First Vice President: Admiral PRESLEY M. RIXEY, U.S.N.

Second Vice President: Dr. GEORGE TULLY VAUGHAN, P.H.&M.H.S.

Third Vice President: Colonel JOSEPH K. WEAVER, N.G. Pa.

Treasurer: Major HERBERT ALONZO ARNOLD, N.G. Pa.

Place for 1907 Meeting: Jamestown, Virginia.

Time of 1907 Meeting: To be fixed by the Executive Council.

The *Secretary* of the Association, being a permanent official, no nomination is made, the office, under the Constitution, being continuously held by Major JAMES EVELYN PILCHER, U.S.V.

On motion the Secretary was directed to cast the ballot of the Association for the officers recommended, which was promptly done and the fact announced to the meeting.

Lieutenant Colonel ALBERT H. BRIGGS.—In retiring from this office as President, I desire to thank you for the support I have received and the hearty co-operation and aid I have had. I retire with mingled feelings of pleasure and regret, for the duties have been both agreeable and considerable. The work in which I have been engaged during the year has been exceedingly pleasant, for it has placed me in close contact with all of you. Captain Jarrett will conduct the President-elect to the Chair.

Colonel VALERY HAVARD, U.S.A., President-elect.—When I came up from Washington as a delegate, I was expecting to have a good and profitable time, and I have not been disappointed, but I certainly did not expect this great honor which you have conferred on me. We all keenly regret the inability of

Surgeon General O'Reilly to be present, and the impossibility of electing him, but by reason of his absence you did not wish to deprive the medical corps of the army of the privilege of furnishing the next President, and for this mark of consideration, I wish for myself and on behalf of the army medical corps, to thank you. It is a great honor which I appreciate fully, as well as the kindly and friendly feelings which prompted it. It is certainly a great and substantial distinction to preside over this Association. It has steadily grown in size and improved in quality, so it is no exaggeration to say that it has successfully fulfilled its mission. Each meeting adds something to our knowledge and efficiency as medical officers, and we and the whole country are the better for it. It is therefore a duty we owe each other and our country to insure its success and prosperity, so that in case war should be forced upon us, we will demonstrate that the art of the military surgeon is to save life, as the art of the man behind the gun is to destroy it. Next year we shall meet at the Jamestown exposition. I hope to have the pleasure of seeing everyone of you there, so that our next meeting may be as successful as our previous meetings have been. Some of the features at the next meeting will be a naval demonstration, so we may hope to see the full medical equipment of the navy, something which will be very interesting to us land lubbers, likewise at Fort Monroe we will see a medical hospital exhibit. In closing our labors before we part, I again wish to extend to you my most sincere thanks, and to wish you all again prosperity and happiness.

RESOLUTIONS OF THANKS.

The following resolutions were presented by Major THOMAS C. CLARK, Minn. N.G., and unanimously adopted.

Resolved, That the hearty and sincere thanks of the Association are most cordially tendered to—

1. The Committee of Arrangements, under the Chairmanship of Major Herbert P. Bissell, for the very complete and satisfactory provisions made for the business and entertainment of the Association at this meeting.

2. To Brigadier General Lucius W. Pettibone, commanding

the Fourth Brigade, N.G.N.Y., for the use of the Brigade Headquarters for the business sessions of the Association.

3. To the Buffalo Club, through its President, Major Roswell Park, for opening its doors a second time for the reception and entertainment of our members.

4. To Dr. Lucien Howe for the delightful luncheon enjoyed in his hospitable home.

5. To the Natural Food Company for the sumptuous banquet and other courtesies extended on the occasion of our trip to Niagara Falls.

6. To Mr. C. R. Eldridge, Manager of the Lafayette Hotel, and his efficient staff, for many courtesies and the satisfactory service rendered to the Association by them.

7. To the Secretary of the Treasury for his kindness in extending the use of the Revenue Cutter *Morrell* to the Association.

8. To Captain Frank M. Chapin and Lieutenant Howard O. Hicks of the Sixty-fifth Regiment, N.G.N.Y., for their active work and many courtesies extended to the Association.

9. To the members of the Buffalo Chapter of the Daughters of the Revolution for the unremitting and delightful hospitality extended to the ladies accompanying the members of the Association.

10. To Mrs. John Miller Horton, Regent of the Buffalo Chapter D.A.R., for the beautiful flowers presented to the Association in her name, and ordered by cable, owing to her absence in a foreign land.

11. To our beloved retiring President, Lieutenant Colonel Albert H. Briggs, and his estimable wife for their untiring efforts for our comfort and entertainment.

12. To our efficient Secretary, Major James Evelyn Pilcher, for his capable management of the affairs of the Association, to Assistant Surgeon W. C. Rucker, P.H.&M.H.S., for his successful work as Assistant Secretary, and to Captain J. Carlisle DeVries for his labors as Reporter.

13. To our faithful Treasurer, Major Herbert A. Arnold, for his efficient care of the Association funds.

14. To not only the persons named, but to all others in any way associated in making the Fifteenth Annual Meeting of the Association of Military Surgeons of the United States one of the most delightful and long to be remembered meetings in our history.

REMARKS OF FOREIGN DELEGATES.

The PRESIDENT, COLONEL VALERY HAVARD, U.S.A.—Before we close, I wish to call on some of the foreign delegates who have favored the Association by their attendance at this meeting, that they may offer us such remarks as they deem pertinent for our edification.

Dr. J. LISANDRO MEDINA, Nicaragua.—I have been honored by being selected to say a few words of thanks for the delegates from Mexico and Guatemala, as well as for my own country. We sincerely appreciate all the honor that has been bestowed on us during our pleasant stay during this meeting. We appreciate greatly having been appointed corresponding members of this society and having been decorated with the emblem that we shall always carry and feel proud of and also be ready to live up to its tenets.

I consider it a great honor and a pleasure to have the opportunity to address a few words of farewell on this occasion.

As a delegate from Nicaragua, I have the pleasure to assure you that my Government takes great interest and follows closely all the advancements that Surgery has made in the last decade.

The study and practice of surgery is the most interesting and fascinating of all, and the wonderful results obtained seems to me has been the mute defender of our noble and true profession in these days of constant and persistent attacks from false doctrines and cynics of all kind.

Every surgeon has a right to be proud of such title, but the military surgeon has more reason for it, as the prefix "Military" means that the science is practiced with courage, discipline, self abnegation, and true charitable purpose as the idea of remuneration never enters his mind.

The services rendered by the Military Surgeon can never be over estimated,—in defense of his country the patriot falls, to

receive in that very moment the tender care and skillful treatment that has been the work of a life time of preparation of the Military Surgeon.

Gentlemen,—in the name of my Government and my self, I wish you all a great success on the fulfilment of your duties, and although I represent here a foreign country or a sister republic, permit me to say that when we are Military Surgeons there is no foreign feeling or boundary,—we are all over the world carrying out the same charitable and noble mission,—so I will say au revoir to one and all of you with the tender feeling of brothers in ideals, aims and aspirations.

Colonel HENRI MARECHAL, France, then made an eloquent address in French, cordially thanking the Association for the courtesies extended to him upon the three occasions on which he had had the honor of representing his nation at the annual conventions of the Association. He wished all success and prosperity to the Association and its members and ventured to express the hope that he might many times in the future have the pleasure of meeting with them.

Lieutenant Colonel W. G. MACPHERSON, R.A.M.C.—It is my pleasant duty to thank you on behalf of my colleagues who represent the British possessions, for the great courtesy and kindness which we have received at your hands. For many years you have honored us with invitations to be present, and I can assure you that those of us who have had the good fortune to be nominated, carry with them the recollection of the United States and its army and navy and its people, as one of the greatest treasures we possess. The eloquence of your Secretary in presenting your decorations was so overwhelming that we were compelled to remain silent. I trust you will believe that any inadequacy in words does not imply an absence of feeling of deep gratitude and kindness. To be comrades with the military surgeons of your country is something of which we are very proud.

Captain HO KAN YUEN, Imperial Chinese Navy.—I am very sorry I cannot speak before the public as I would like to. Being a representative from China, I thank this Association on behalf of my country for the courtesy and kindness that have been ex-

tended to us. We have been much enlightened by the deliberations during your meeting and we greatly appreciate the opportunities afforded us. In conclusion I wish to thank you and wish for the continued prosperity and happiness of all of you.

Staff Surgeon ARTHUR GASKELL, R. N.—I did not think I was going to get in for a speech. I thought Macpherson had done it all as it ought to be done. I have frequently begun a speech but was never able to finish, and this will be memorable if I can finish it today. You have been so good to us. You have filled our brains with knowledge, and the rest of us with almost anything, and it will take a long time till I get over it. Our last representative had the reputation of being one of the most convivial officers we possess, but you were too convivial for him. When he returned he had to go to Las Palmas to recover. I am supposed to be fairly hardened, but I am wondering where I shall go for my leave of absence. Now we get on to the heavy sentimental. I felt the other night when I had this beautiful insignia given to me, that it was an honor which ought to call for a beautiful speech, but I could not think of words to use so I sat down overcome with emotion. When I return to England and go to the Admiralty, I shall show them first the decoration and will tell them all about your courtesy and kindness and the erudite lectures I have heard. The work done by this Association does undoubtedly promise a great future. We all of us have serious times in our lives, and the military doctors, in which I hope I may be included, all have active and strenuous and serious times in active service. My active service has been but little, but such as it was I realized then what an absolutely distinct art military surgery was. By an association of this kind we are able to learn what it is. Textbooks are practically nil, and the majority of civilian doctors I am sure, think there is no difference between the military and civilian doctor. They may send out civilian naval doctors to take part in naval warfare and they will not be of much use. There is something about the work aboard ship which one must be accustomed to. We all look forward with excitement to the time when we may see some active service on the sea. If you come out of it alive you receive special promotion and medals,

the smiles of the ladies and worship of the men. If you do not come out of it alive you may end by a torpedo exploding in or under the ship,—that is the death I hope that is waiting for me. You are all the best of hosts, and I shall hope to meet you again in England or anywhere.

Major WILLIAM H. W. ELLIOT, I. M. S.—My brother officers of the British services have taken the wind out of my sails, and left little for me to say. I must thank you however for your kindness and hospitality, and the great honor you have done me in electing me a corresponding member of your Association. It is a pretty far cry from India, and I shall be going back in a few months. A great many of your countrymen come out there. There are many beautiful things to see; therefore, it may be that some of you may be tempted to go there. If so, I hope we shall have an opportunity of meeting. I shall leave Buffalo with great regret because I have had a good time here. I hope I shall have another opportunity of coming, but the Indian government only nominates officers home on leave. I may, however, get the same good fortune again.

The SECRETARY then read the list of committees for the ensuing year, after which the Association adjourned to meet in Jamestown, Va., at such dates as shall be fixed by the Executive Council in October, 1907.



The Public Meeting.

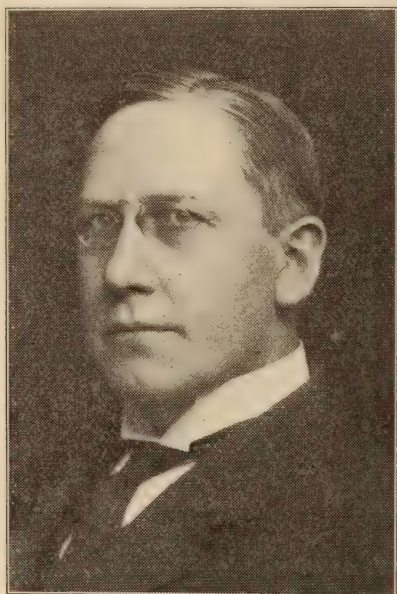
INTRODUCTORY REMARKS.

By MAJOR HERBERT P. BISSELL,

CHAIRMAN OF THE COMMITTEE OF ARRANGEMENTS.

THE very pleasant duty now devolves upon me as the presiding officer and as chairman of the committee of arrangements that has endeavored to aid the very able, popular and efficient President of your Association in his preparations for this convention, of extending to the members of this Association of the Military Surgeons of the United States and to their distinguished guests from other lands, a hearty welcome to the city of Buffalo. I assure you that the citizens of Buffalo gratefully appreciate the selection of this city for this convention, and we trust your stay will be profitable and enjoyable. We naturally feel an especial pride in your coming to us this year for your President is one of Buffalo's best and highly respected and public spirited citizens, and we hope that you will derive from meeting the rest of us something of the pleasure and satisfaction that we know you will derive from the courteous and splendid personality of Colonel Briggs. We are glad you are with us, and we rejoice at this opportunity afforded us to entertain an association whose lofty purpose is to alleviate human suffering and to aid and comfort poor humanity. Your calling is indeed a noble one, and we feel sure that your deliberations will be good for Buffalo, its citizens and yourselves. It is indeed superfluous for me to argue that association and co-operation are of immense advantage in a profession like yours, but the value of association is now so generally recognized that there is scarce a craft in which people are interested, which has not recognized that adherence in society

and unity of action tends to produce fraternal assistance among their members. That sentiment of fraternity, that sympathy which springs from the realization that we are members of one great human family works mightily in accomplishing what is best for mankind. The medical profession occupies a leading place among the beneficial organizations of the world. Your object is to mitigate the miseries of mankind, and to render warfare humane. It is always claimed that the first and most important



Major Herbert P. Bissell.

Chairman Committee of Arrangements.

impulse of man is for religious association and the sympathetic worship of the Supreme Being. Nurse the sick, instruct the ignorant, relieve the poor, guide the erring, and raise up the fallen. While all of the professions are bound together in this organization, and the clerical profession is placed first in all works of morality, your profession is placed a good second, and the legal profession is placed last, if a benighted populace will give it any place at all. It possesses that kind of a fraternal sentiment which causes lawyers to display a helpful sympathy for one another. No quarrels have we of our own. We manage others'

broils, and though we fight with all our might, we have buttons on our foils. We scratch the other fellow's eyes out and dine with him and scratch them in again. I was not invited to defend the legal profession however or give advice to the medical profession. I was asked to preside. With renewed assurances that the people of Buffalo entertain a genuine satisfaction in having you with us, I hope your convention will be so successful, and your recollections of Buffalo so agreeable, that we shall soon have your presence again in our city.

THE CITY OF BUFFALO.

By HON. LOUIS P. FUHRMAN,

ACTING MAYOR OF BUFFALO.

I BID you welcome to Buffalo. I confess when I found among my duties an engagement to welcome you, I hesitated for I am a civilian butcher and not a military surgeon. I was not quite sure how your profession and my business would blend in hospitality, for the difference between surgery and slaughter is one only of development. One is called a profession, and the other business, and both are a science. In the name of Mayor Adam and on behalf of our city, I extend to you the assurances of our pleasure over your presence, and hope that your convention will be successful, and your visit filled with much happiness. We are proud of our hospitals. We are proud of our surgeons, second to none in any land. They are men who have helped their fellow man. I think a visit to our slaughter houses would be of interest to you. Your soldier patients depend for their food upon the slaughter houses. There is no meat better than Buffalo meat. Our slaughter houses are clean and sanitary. We have hopes soon of a fine new Marine Hospital. We will be glad to meet old friends again.

THE BUFFALO MEDICAL PROFESSION.

By MAJOR ROSWELL PARK,

LATE BRIGADE SURGEON IN THE NATIONAL GUARD OF NEW YORK;
PROFESSOR OF SURGERY IN THE UNIVERSITY OF BUFFALO.

SINCE last you met in Buffalo your organization has grown in importance and influence, of which there is no better evidence than the presence of the distinguished delegates and guests from foreign countries, to whom we of Buffalo especially wish to extend our most cordial and hospitable welcome. Their visit here would of itself make memorable any occasion, and to the learned and honored gentlemen who visit us, coming from the British possessions, France, Germany, Turkey, Mexico and the American Republics and from China and Japan, let me say that Buffalo is proud to have them here and congratulates herself upon their visit,

In fact, Buffalo citizens, lay and professional alike, congratulate themselves that you saw fit, not alone to elect one of her most respected and honored physicians as your President, but to ensure his genial presence by selecting his home city as your meeting place. As in the discharge of his regimental duties so in the performance of those generally pertaining to his profession, your President occupies a position in the esteem and love of this community and of his soldier boys which but few ever attain.

That Buffalo is glad to see you is evidenced by the fact that our homes and clubs are gladly opened to you. The Buffalo Club has made you its guests during your stay and eagerly awaits the opportunity of extending to you tomorrow night its amplest hospitality.

We regret the inability of the Surgeon Generals of our own Army, Navy and Marine Hospital Services to be present. From each of them I have had personal letters, expressing their deep regret that official duties require their presence in Washington even at this time when they would so gladly join their colleagues and when we would so gladly welcome them.

It is not necessary for me to call your attention to the value of the services you render to the nation nor to the deeds of bravery which you and your associates perform. Abler tongues than mine have told of your heroism and valor on the battlefield, and you alone know of the courage and devotion to duty that have been there exhibited by the members of your Association and your colleagues. Unfortunately, the public do not know of these, and, unfortunately, your courage and zeal have failed in securing adequate public recognition. For that reason I am the more pleased to refer to it now. Did the public realize the facts and appreciate the inadequate compensation which medical officers receive for the lives and strength they expend, the Medical Departments of the Army and Navy would be more suitably compensated. Did other things fail to remind me of these facts it would be enough that three or four of the brightest and most promising of my own former students and hospital internes have lost their lives in the Philippines, a sacrifice to the needs of war, the rigors of climate and treachery of a cruel enemy.

The time may come when the public will realize the true value to an armed or fighting force of a well trained medical corps, but it is not yet here. The time may come when commanders will regard their medical officer's advice as law, and the time may come when our legislators shall realize that to vote immense sums for the purposes of destruction and entirely inadequate amounts for the purposes of salvage of life is to reveal lamentable and disgraceful lack of sense of due proportion of things and the sad want of realization of the realities and needs of army life and armed men.

Some twenty years or so ago it was my lot to be editor of a small medical journal, at that time published in Buffalo, while, at the same time, I was surgeon to the Fourth Brigade of the State National Guard. There was then no provision among the troops of the Guard for anything that looked in the direction of a hospital corps nor of any adequate provision for the care of sick or wounded men. Struck by the inadequacy of means for this desirable purpose, I ventilated my disappointment in an editorial published in the December number of *The Medical Press of Western New York* for 1886. From it I wish to quote the following paragraphs:—

“It is a matter that cannot be made too public, that while each regiment is provided with a surgeon and assistant surgeon, and while each separate company is supposed to have a medical officer—though but few have one in reality—there is absolutely nothing in the way of a properly drilled or equipped medical service; neither is any provision made for such drill, instruction, or equipment. If, for instance, one of our regiments were called into service out of town, and men were injured, they would have to extemporize every stretcher that was used, while the nearest wagon would have to be appropriated as an ambulance. Moreover, the stretcher bearers would be dependent only upon their own humane instincts for knowledge as to how to lift and carry the wounded, for no instruction is given concerning this.

“Ever since the writer has been connected with the State Guard he has found his brigade commanders in unison with himself in the feeling that some provision should be made both in the

way of appliances and instructions in their use; nevertheless, they have always been hampered by the fact that no such humane provision was contemplated at the politico-military headquarters in Albany, and that requisitions for such appliances were useless.

"Unfortunately, too, the indifference as to the care of the injured soldier is widespread beyond the limits of the State. We know of nothing adequate in this line in any State organization, nor even in the regular service. To be sure, a circular emanating from the Surgeon General's office deals with the matter of transport of the wounded, the best style of ambulance, etc., but none of these commendable vehicles are ordered for actual use of the present regular troops. The writer recently inquired of a regular officer as to what regulations were in force concerning detail of men for stretcher and ambulance service, and was surprised to find that there were none. How, then, was provision made for such duty, he asked, and learned that it was a matter left entirely to the discretion of individuals. This may not be so bad among men splendidly disciplined, few of whom are at any one time under fire for the first time, and with the traditions of the army war times to guide them; but it would be far different with our untried State troops in actual service, even in a domestic riot. Medical officers who never join their commands except on dress-parade have no incentive, under the present regime, to thoroughly familiarize themselves with the routine of such possible duties. We do not know that they have any authority, except when specially delegated, to order details of men to learn how to carry a stretcher, or lift a wounded man into an ambulance. It is all wrong; and it should be righted by a special general order from Albany.

"Another matter of equal importance: The powers that be attach an ever-increasing importance to marksmanship; to the faculty of killing or disabling the enemy. But in the matter of self-preservation they have no enthusiasm beyond their own persons."

After this I called attention to the value of the soldiers' dressing packet which is now everywhere carried and, finally, intimated that our city policemen saw many more cases of injury, even gun-

shot wounds, than did our National Guardsmen, and that it would be a very good thing if every patrolman were furnished with the same packet and instructed how to use it. This was a very unassuming place in which to call attention to so important a subject and the effect of the little editorial seems to have been far more reaching than I at the time dreamed it would be, since it was copied in full into *The Army and Navy Journal*. This suggestion, or some other coincident measure and stimulus, served to bring about such a change in affairs that only three months later, namely, in March, 1887, and in the same journal, I was able to insert the following note:—

“Not long ago we made some editorial comments on the fact that in the National Guard no provision was made for the care of the wounded other than the mere appointment of surgeons. Since that article appeared, we are happy to say (and, by the way, it was copied in full in *The Army and Navy Journal*) considerable activity has been manifested at military headquarters both in this State and in the regular service. Post surgeons have been directed to give instruction to officers and men; and regimental surgeons in the State guard are soon to undertake the same duty.

“After all, Homer was not far out of the way when he made Nestor say:

‘A wise physician, skilled our wounds to heal,
Is more than armies to the public weal.’”

In view of these circumstances it is perhaps not too much to claim that Buffalo has played a leading part in the conception and organization of hospital corps work and better care for the sick and wounded.

Even yet, however, our line officers are slow to learn that there are more cases of sickness in the army than gunshot wounds and that the majority of soldiers who die in the service die of the former rather than of the latter. Moreover they have yet to learn that the former, namely sickness, is to a large extent preventable, as has been shown so brilliantly by the work of the Japanese military medical corps. Therefore, there remains yet much to do in this direction, and if you will permit me to re-

count something further of my own efforts in the matter, although a humble citizen of what is supposed to be a provincial town, I have repeatedly taken up the subject with the powers that be at Washington, and have called attention to the fact that at such schools as West Point and Annapolis, where the whole trend of the teaching has been to show how to kill or disable the enemy, and not how to properly care for our own troops, there is need of very much more teaching on this subject in order that officers may learn that which they all ought to be taught, namely, that he is the best officer, other things being equal, who has the greatest regard for the physical welfare and the health of his men, and that the assumption that the medical officer is transgressing his powers and his duties if he concerns himself with the matter is a most unfortunate one and conduces to results the reverse of those which are so desirable. It has been my fortune to correspond with members of the Committee on Military Affairs, as well as with officers stationed at West Point and with Boards of Visitors on this point, and, while when the subject is actually under discussion, there seems little or no difference of opinion, it is as hard to direct adequate legislation in this direction as in many others; apathy and finally indifference being the result of a lack of knowledge and appreciation of the true state of affairs.

THE STATE OF NEW YORK.

By HON. R. B. MAHANEY.

YOUR President, Colonel Briggs, sent me a very hurried call to respond to the somewhat staggering proposition of the State of New York. To our foreign friends who do not know that in the United States New York is the Nation, as Paris is France, I demurred. He said: "Be sure to wear your full dress suit." My naval friends will understand when I say that it "is out of commission," but they will admire my courage in facing this galaxy of beautiful and magnificent women in my unadorned self. My excuse is that I am to respond to "The State of New York." This covers a multitude of sins, almost

equal to a dress suit, and I want to say to this audience, that it is a remarkable thing that in the recent Russo-Japanese War what impressed thinking people most was the reported fact that the Japs reduced to the minimum possible mortality from the results of battle, and so, from that single fact, this Association, this meeting, has a most significant and a most important bearing in the welfare of mankind. After all we do not care so much how many men die if principles live. Men are nothing. They are the creatures of God, and God in his generosity, propagates all species almost as it would seem, without consideration. It is our business as public men, and as men having public questions at heart, to advance, to encourage and to abolish those things which reduce the status of human conditions, and advance the greatness of nations, because no matter what nation, we are children of God, and what he does is good; therefore, we must not undo it unnecessarily, and the military surgeon is here that it shall not be undone unnecessarily.

I would be glad if the time came when men should not go to war. We say we are free. I think we are the most abject slaves that this earth has ever seen, but as long as the sword can cut the Gordian knot, so long will the military surgeon be of use and advantage—not to one nation, not to one army, but in the broader principle of humanity, that after the sword has attempted to settle the difficulty, humanity shall intervene. So long as the world has differences of opinion, so long will the military surgeon be an important factor in the consideration of cabinets, and in the United States today, I know from some experience and knowledge, that we have not given them all the opportunities, nor all the rights or emoluments which should go to men who are so important in the crisis of affairs.

You men and women instinctively understand that it is easy for men to go into battle to die or suffer, but there is nothing more creditable to a nation than to take care of, protect and alleviate the suffering of these men who are willing to die that the principle for which the nation stands shall live, and that is where the military surgeon becomes important. Speaking more generally for the United States, I may say to you surgeons of the United

States and of the National Guards, and to you visiting gentlemen, that there is nothing in the United States or in the great State of New York, or in the other forty-four sister states that you cannot count upon in the great work of ameliorating the horror of war, though let it be understood that I do not say that we ever want a cessation of war.

THE RESPONSE OF THE PRESIDENT.

BY BREVET LIEUTENANT COLONEL ALBERT H. BRIGGS,
PRESIDENT OF THE ASSOCIATION OF MILITARY SURGEONS
OF THE UNITED STATES.

IN behalf of the Association of Military Surgeons of the United States, I thank you for your kind and hospitable words of welcome. We came to your beautiful City at the urgent invitation of its Chamber of Commerce, seconded by those in



Lieutenant Colonel Albert H. Briggs,
President.

authority in the City Government. Buffalo's reputation for hospitality, however, had preceded your invitation, and although other cities had urged their claims with many attractions to back them, the Queen City of the Lakes was unanimously chosen. We are delighted to be here, and when the hour of parting comes, and we say good-bye, it will, I am confident be with sincere regret.

As our rules and regulations require, we come to you dressed in the uniform of soldiers. We are proud of the livery our various countries require us to wear. But although we are in every sense soldiers, yet *our* mission is one of *peace*. Even though grim visaged war settles down over a land our work of mercy goes on, stimulated

to greater effort by wounded and suffering men on every hand. While our comrades of the line strive by every effort in their power to destroy life, we on the other hand are equally as zealous to save it. While they cause wounds and suffering, we bind up to heal and allay pain; while they tear down, burn and destroy, we build up and save. Every nation recognizes our humane mission, and wherever the flag with the Red Cross floats, no battery, even of an enemy, drops its bursting and death dealing shells. The charging squadrons part, even in their mad rush, and pass by, leaving unharmed the places made sacred by the helpless sick and wounded. Every disabled soldier, even though he may be clad in the uniform of an enemy, who comes under the shadow of the hospital flag, is equally cared for. Nations may grapple in the deadly strife of war; but for us there is no war—our mission is one of peace and good will towards all men.

In the discussion of the late war between Russia and Japan, their apologists at our present meeting, will argue, not as to who caused the greatest sufferings, wounds and death, but which side was most successful in preventing disease, and restoring to health and usefulness the wounded.

We have with us representatives from many foreign lands, men eminent in their own countries, who have been sent by their governments to take part in our discussions, and give us of their knowledge and experience. It is possible we may meet some of them in the future on the battlefield, which, God forbid, but if we do it will never be as enemies, for we will all be engaged in the same humane effort, to allay human suffering and misery.

Slowly but constantly the time is coming when nations will learn that war is unnecessary. I think the entering wedge was the Geneva Compact, which spread the protection of mercy over sick and wounded soldiers with its emblem of the Red Cross. Soon we will learn that if the sick and wounded can be protected, the healthy and strong need not be mutilated to settle differences between nations. God hasten the time when the soldier's spear will be turned into a pruning hook, and his sword into a plow share.

The deliberations of our Association will, I am confident, be of interest to many who are not connected with the profession of Medicine and Surgery. If there are any who would be interested in our proceedings I will say, the doors of our assembly room stand wide open and are guarded by no sentry. You are cordially invited to come and listen to the reading and discussion of the papers. If there are any who understand, or think they understand, the French or Spanish languages, they will have an opportunity to test their accomplishments, as some of the papers will be read and discussed in those languages.

The Association of Military Surgeons, like many other great and good things, started in a modest and humble manner. The world owes to the fertile and far seeing mind of General Nicholas Senn, of Chicago,—whose fame as a Surgeon is a household word in every land in the world,—the origin of the idea, for it was he, associated with less than half a score of Medical Officers of the National Guard, who founded it. Gradually its field of usefulness has been extended until it comprises the Army, the Navy, the Public Health and Marine Hospital Service, as well as the National Guard of the United States. It is now working under a charter granted by Act of Congress. To its meetings are today, or have been in the past, sent representatives to take part in its deliberations and aid in its work, by nearly every government of the world. It publishes a monthly *JOURNAL* devoted entirely to its interests which circulates in every land of the globe. Its mission is a noble one,—to prevent and stamp out disease; to administer to the sick, whenever found; to put the wounded on the road to perfect recovery, and to do everything which modern science and skill can command to alleviate human suffering. Many of us who were at its birth, and who aided to nurse it through its helpless infancy, are growing gray and feel the infirmities of age creeping over us. But when our feeble hands can no longer bear its banner to the front, younger and abler ones will take our places and continue its glorious work.

In this great world wherever a soldier is camped, or out on the ocean, where the great navies of every nation float, regardless of what flag flies over them, the beneficent work of this Asso-

ciation is now felt, and soon in thousands of homes, humble or grand, from which a soldier or sailor may come, glad hearts welcoming home the dear one, saved from a needless death, will give thanks to the men whose care and skill have made this possible. Our work has only begun. There is very much to do in the years to come. In the next great war, the eyes of all nations will look to the Medical Staff for such action as will prevent needless sacrifice of human life, and woe to those in authority, who by carelessness or ignorance, allow preventable diseases to decimate our camps, or wounded men to suffer and die for want of protection and supplies.

There is much to stimulate us on in our work; the field is broad; the harvest great, and it will continue until the end.

MALARIA IN THE TROPICS.

ACCORDING to the experience of Colonel W. C. Gorgas, Chief Sanitary Officer, Isthmus of Panama, as told by him in the *Journal A. M. A.*, On the Isthmus of Panama the conditions are about as favorable for the spread of malaria as in any part of the world, and every effort has to be made by the sanitary authorities to check its dissemination. Fair success has been attained, however; out of 22,000 employees during the month of February there was only a daily average of twenty-two incapacitated, three-fourths of them from this cause, a total which would not be excessive even in a northern community. The majority of cases were of the estivoautumnal type, but not unusually severe. Out of 1,055 cases treated by Gorgas in the last six months, there were only five deaths. The malaria among the whites seems to him about as severe and no worse than that occurring along the gulf coast of the United States. Even in hemoglobinuric fever, the results were strikingly good. Out of twenty cases there were only three deaths.

Contemporary Comment.

PENSIONS AND PROSECUTION.

SUITS against municipalities for diseases due to bad sanitation, says *American Medicine*, are now being prosecuted successfully in several places and it is reported that the courts are awarding heavy damages. This is a most desirable outcome of society's criminal neglect of the safety of the citizen. Governments are just what the people make them and the people as a group constitute a corporation as soulless and brutal as any other trust. It can be attacked in only one way—its pocket-book—for it is an immortal, unmoral, selfish organism almost oblivious to appeals to its humanity. It naturally does nothing except what is for its own benefit. It can be brought to sanitary decency by making insanitation expensive.

Typhoid fever in Cincinnati is illustrative. It is reported that the corporation did not provide sufficient good water, and was compelled to pump river water directly into the mains causing 261 cases of typhoid in the first twelve days of June. The military camps of 1898 were not so bad after all. If these facts are as reported each of these men is legally entitled to heavy damages for illness which the city could have prevented if it had spent the money. If the damages are properly awarded it will cost more than it would to have supplied the grade of water the citizens are entitled to receive. In other words it is now proved that it is society's duty to prevent preventable disease and it must be fined for neglect of duty. As individuals we are at the mercy of the corporation, our appeals fall on deaf ears, but at last the worm is turning.

Pensions and preventions may now be compared, for this awful annual bill of expense due to preventable camp infections, represents an income from several hundred million dollars. It would

have been cheaper to borrow and spend a half billion of dollars on camp sanitation in 1898, and beside we would have saved the lives of these fine specimens of American manhood. Our penny-wise and pound-foolish policy in war time is nothing short of puerile. It is justifiable to hope that our pensions will be still more enormous, for in no other way can the government be taught that the best preventive methods must be used, no matter what the cost. Then we can expect to see a more wholesome respect for military sanitation.

If in 1898 we had had five times the number of skilled military surgeons and had given them sufficient rank and authority to have compelled the adoption of their plans, instead of insolent rejection of them with threats of court-martial for their insubordinate fussiness, the nation would now be a half-billion dollars richer. Let this lesson sink in. Let soldiers demand pensions but let them also sue for damages due to bad sanitation.

IS THE MEDICAL OFFICER NONCOMBATANT?

THE present military system says *American Medicine* also, is evidently an anachronism—an inheritance from a past age when surgeons were barbers. From a civilian's standpoint we will see that any system which interferes with the efficiency of any part of the army must be a vicious one, and that no physician can serve his country properly if he is so treated. We hope there will be a change. The law states that no matter how able a surgeon may be, he is not as competent to command a few soldiers as a boy lieutenant just loosened from the apron strings but legally a "combatant." As we understand it, no medical officers in the army desire command of troops, nor do they wish to be considered as "fighters" in the sense of carrying a rifle and bayonet, but they do demand a change from the anomalous position which makes an invidious distinction between them and the staff officers who are not required to know as much of military science, who are never in dangerous places, yet who are legally considered to be combatants in a little higher sphere in the military hierarchy. When the desired change is made,

we can expect to hear that a military surgeon's opinions and recommendations cannot be ignored with impunity as at present. Then and then only will medical science be able to prevent such scandalous conditions as existed in our camps in 1898. The army will oppose any change and it must be made in spite of the army. Like every other military form, it must come from outside pressure. If we had more "fighting doctors" we would have fewer dead soldiers, because an experienced doctor's opinion could not be disregarded by a school boy made into a "fighting" second lieutenant and given a position of authority before his brain has grown to its adult size.

HUMANE FIREARMS.

THE early recovery from wounds caused by modern small-caliber rifles has now been commented upon for ten years, but the far-reaching consequences of this one fact are just about dawning upon us. According to the *Army and Navy Register*, Dr. Zöge von Manteuffel, of the Russian army, recently reported to a surgical congress in Berlin, that shell wounds were generally fatal, shrapnel wounds dangerous, but the rifle wounds often, if not generally, healed. Incidentally he mentioned that the wounded could not be treated in the firing zone but had to be removed far in the rear or to the hospitals on the lines of communication. Plans to do this are now being strongly urged by our own medical officers in spite of considerable opposition. The old system of well-equipped mobile field hospitals where everything could be done, had to be abandoned. Doctor Schäffer, a German military surgeon, stated that the total and proportionate number of fatal injuries was about the same as ever, but from the large number of small bullet wounds inflicted, the percentage of early recoveries was remarkable. In some regiments seventy per cent of those wounded at Mukden were again in ranks within three months. This is the startling surgical fact bound to modify future warfare.

Modern firearms are too humane and unless battles are vigorously followed up, the retreating enemy is merely stunned—

not disabled. If these wounds had been more severe the Russians would not have been able to restore their ranks. The Japanese, themselves, were always too exhausted after a battle to follow up their advantage and were never able to give a fatal blow. In other words, we are at the ridiculous paradox of possessing weapons so harmless that we cannot disable the enemy. Battles in spite of their frightful loss of life—no greater though than previously—are becoming gigantic French duels. The “code” evaporates when it always results fatally. Wars of national duels will also end when they are too deadily and too expensive. Warfare demands a more deadly weapon, for the present tendency is as absurd as arming soldiers with boxing gloves. Already there is a demand to return to the old 45 caliber pistol because the 38 does not wound sufficiently. We may soon expect to hear a demand for a rifle so severe that when an enemy is hit, he is permanently disabled from fighting, at least during that war.—*American Medicine*.

MOSQUITO WORK ON THE ISTHMUS.

A HISTORY of the mosquito work on the Isthmus is given by Colonel W. C. Gorgas (*Journal A.M.A.*). Each new patient is put under a wire cage, just large enough to cover his bed, and kept there until the infectious stage of the disease is passed. Besides using every method of keeping mosquitoes out of the wards, these are fumigated every two weeks, which is sufficient, with the known period of incubation of the mosquito, to catch all of them before they have time to do harm. Houses in which cases originate are fumigated, as also the adjoining ones, sulphur being usually employed. If the patient elects to be treated at home his room is screened and guarded and the rest of the house fumigated—his room being again fumigated after the termination of the case. The campaign against the breeding places of the stegomyia has been efficient so that ninety per cent of their breeding places have been destroyed in the city of Panama between March and October of last year.

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Editorial Expression.

THE SOCIAL SIDE AT BUFFALO.

IT was anticipated that the Buffalo meeting would excel in its social features. The hospitality of the Queen City of the Lakes was so well known to the Association that disappointment would have been felt had there been other than the most agreeable relations with her people. The local arrangements were a model of completeness, as would have been expected from the long experience of President Briggs, who had



The Lafayette Hotel.

been instant, in season and out of season, in labors for the success of the meeting. The Brigade Headquarters in the German Insurance Building were in many respects the most desirable meeting rooms the Association has ever had. The Auditorium was ample and conveniently arranged, offices and committee

rooms were abundant, and the buffet provided for the refreshment of the members was an innovation, which, it goes without saying, met with much approval.

The Lafayette Hotel was everything that could have been asked in the way of headquarters. Its rooms were spacious and finely furnished, and its administration was characterized by a desire to please that was highly appreciated by all of its guests. No member of the Association was turned away without accommodations, although, in not a few cases, other guests were met with the statement that there was no more room.

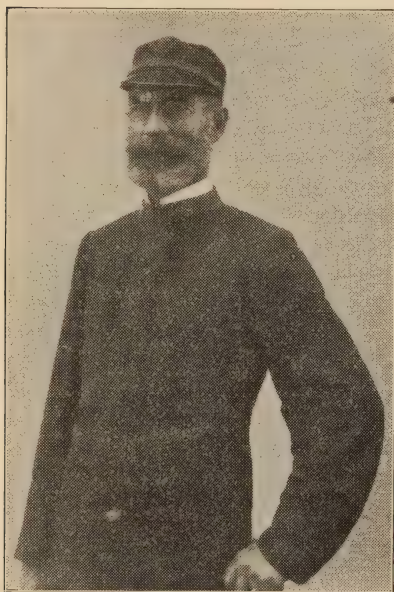
The reunion of Monday evening was enthusiastic and unique, owing to the participation of so many of the older members of the Association who had come to Buffalo to pay especial honor to the President. The foreign delegates on this evening, and indeed upon every social occasion, proved themselves to be lions of the most agreeable description, and added very much to the pleasure of the several occasions.

The general reception to the Association at the Lafayette Hotel on Tuesday evening was a gorgeous affair, and the reception hall was crowded with the beauty and elite of Buffalo, whose courtesies to the Association was most highly appreciated.

The luncheon given by Dr. Lucien Howe, the distinguished ophthalmologist, to the officers and foreign guests of the Association, to which also were invited the members of the Buffalo Academy of Medicine, was a delightful occasion, the hospitality being extended to include as officers all members of committees and practically the entire Association.

The reception at the Buffalo Club was an occasion memorable in the social annals of the Military Surgeons. It so happened that an Honorary Member of the Association, Major Roswell Park, the distinguished surgeon, was President of the Club, and, through him and General Samuel M. Welch, the Association was received in sumptuous style. The magnificent club house was given over freely to the guests, and the officers of the Buffalo regiments of the National Guard of New York were on hand in large numbers to assist in the entertainment. The Club was wide open, and her facilities were at the service of her guests without limit.

Friday was devoted entirely to the social phase, and the members and delegates took advantage of the opportunities in far greater number than ever before. The Secretary of the Treasury had courteously placed the United States Revenue Cutter *Morrell* at the disposal of the Association, and from nine o'clock in the morning until noon, the time was consumed in a most delightful sail about Lake Erie and down the Niagara River. An



Acting Assistant Surgeon William H.
Marsh, P. H. & M. H. S.

interesting feature of the occasion was the discovery that Acting Assistant Surgeon W. H. Marsh, P. H. & M. H. S., one of the oldest members and most constant attendants upon the meetings of the Association, had that day learned of his attainment to the dignity of a grandfather. A large number of his friends joined in the purchase of a handsome silver loving cup, which was presented to him, together with a number of suitable toys, for his grandchild, the whole affair being conducted in inimitable fashion by Major Clark, of Minnesota, whose wit, humor and facility of speech have long been the admiration, envy and

delight of the attendants at our annual conventions.

Upon arriving at the terminus of the Niagara River trolley line, the Association was transferred to cars and taken across to the Canadian side and given the round trip from above the Canadian Falls, upon the Canadian bank down to the Brock Monument and across the Suspension Bridge, then up the gorge on the American side to Niagara Falls, and to the magnificent establishment of the Natural Food Company. Here, under the direction of Major M. B. Butler, a bounteous banquet was served

in the beautiful dining hall of the establishment. A hundred and thirty guests sat at the tables and partook of a beautifully served and deliciously prepared dinner of numerous courses, after having enjoyed the opportunity of examining the remarkable manufacturing methods of their hosts.

At this point fully half of the members, by trolley, by train, and by boat, left the party for home and for other points of travel. The remainder of the party returned to the *Morrell* and were carried back in happy mood to Buffalo, the entire trip occupying about twelve hours.

The ladies accompanying the members owe very much to the delightful courtesy of the Buffalo Chapter of the Daughters of the American Revolution, whose cordiality was invariable and whose hospitality was unfailing. In addition to the events in which they participated with the Association itself, the ladies were given upon Wednesday morning a long automobile trip about Buffalo and her beautiful parks and suburbs, a reception at the Twentieth Century Club in the afternoon, and a theater party in the evening. On Thursday morning they were entertained by a trip to the Albright Art Gallery, with luncheon at the Park Club and a visit to the Historical Society Building in the afternoon, in addition to which they received many individual courtesies from the ladies of Buffalo.

There were also many individual courtesies extended to the members. All of the clubs opened their doors wide to the visitors, many of the physicians extended the use of their carriages and automobiles to the members, and the homes of the city were freely opened. Conspicuous among these, was a charming luncheon given by Dr. Nelson W. Wilson at the Iroquois Hotel on Tuesday, a meeting of the Sons of the Revolution at the residence of Mr. Charles H. Williams, to which a number of the members and guests of the Association were invited, and a dinner tendered to the officers of the Association and the foreign delegates by Major Park on Thursday evening, where "Hands across the Sea" was the keynote of the occasion.

Indeed everything was done that should have been done, and nothing was left undone upon the part of our Buffalo friends that would tend to the enjoyment of the occasion.



Colonel Valery Havard, U.S.A., President.

THE OFFICERS OF THE ASSOCIATION—1906-1907.

IT was the source of great disappointment to the Association that its distinguished First Vice President, Brigadier General Robert Maitland O'Reilly, the Surgeon General of the Army, was unable to be present at Buffalo to be elected President of the Association and inducted into office. But his absence as a delegate to the Geneva Convention, from which he had just returned to find an enormous mass of accumulated work, rendered it impossible for him to leave Washington. He had, however named as his representative an Assistant Surgeon General of the Army, the Chief of the Library and Museum Division of the War Department, in whose person the Association was glad, with General O'Reilly's cordially expressed approval, to honor the Army Medical Department by election to the Presidency.

Colonel Valery Havard has for many years been known as one of the most progressive and efficient medical officers in the American Army. He was born in Compiègne, France, on the 18th of February, 1846, and received his early education at the Institute of Beauvais. Coming to America, however, he completed his education at Manhattan College, New York, which afterwards honored him with the degree of M. S. in 1871, and where he served for a time as Professor of French, Chemistry and Botany. His medical education was gained at the University Medical College in New York, where the doctorate was conferred upon him in 1870, this being supplemented by part of a course in the *École de Médecine* in Paris. He became one of the internes at the Children's Hospital in New York in 1871.

When the Army Medical Corps, after six years' closure was again opened to candidates for admission, Dr. Havard appeared before the examining board, and was promptly successful in securing an appointment, to which he was commissioned on the 10th of November, 1874. He progressed in due course through the grade of Captain in 1879, to Major in 1891. During this period he devoted much attention to the subject of Army medical organization, and while stationed at Fort Abraham Lincoln in 1889 published a Manual of Drill for the Hospital Corps and

Company Bearers of the United States Army and National Guard, a most excellent work upon the subject, and showing much judgment and discrimination. He was from that time conspicuous in the organization of the Army Hospital Corps, and commanded one of the first Hospital Corps Schools of Instruction, established at Fort D. A. Russell, Wyoming.

When the Spanish-American War broke out, he became attached to the volunteer service and from August 1st to November 5th, 1898, served as Lieutenant Colonel and Chief Surgeon of United States Volunteers. He was Chief Surgeon of the 5th Army Corps at Santiago de Cuba from July 23rd to September 1st, 1898, and became Chief Surgeon of the Department of Santiago upon its establishment, September 1st, 1898, until April 20th, 1900, when he was transferred to Havana as Chief Surgeon of the Division of Cuba, remaining upon the staff of the Governor General until the transfer of the Island to the local authorities when he resumed station in the United States. The high value of his work has recently been again recognized by his detail as chief surgeon of the army of occupation of 1906, in Cuba.

In 1877 he saw active service against the Sioux and Nez Percé Indians. In 1905 he was assigned to duty as military medical attaché with the Russian forces in Manchuria where he made many observations of great value, some of which have been reported to the Association. His work however was cut short by his capture at Harbin, when that stronghold was taken by the Japanese forces, and when he was courteously deported.

He was promoted Lieutenant Colonel and Deputy Surgeon General, October 24, 1901, and became Assistant Surgeon General with the rank of Colonel on April 26, 1904. As Surgeon of the Military Academy, and as Chief Surgeon of the Department of the East, he maintained his high reputation as an administrative officer and high anticipations are held of his work as President of the Army Medical School and Chief of the Library and Museum Division of the War Department, the official duties now entrusted to him.

Colonel Havard became a member of the Association of Military Surgeons upon the opening of membership to the officers

of the regular army, and has been an active and interested member during this entire period.



Rear Admiral Presley M. Rixey,
First Vice President.

has recently returned from a tour of inspection of our naval stations beyond the seas, which will enable him to still further improve his service and develop its work.

The Second Vice Presidency was filled by the advancement of Dr. George Tully Vaughan, until recently Assistant Surgeon General in the Public Health and Marine Hospital Service. The work of Dr. Vaughan for his service has been so conspicuous that the members of his Corps insisted upon his representing their

In 1901 he was a successful competitor for the Enno Sander Prize, with a scholarly essay upon "The Most Practicable Organization for the Medical Department of the United States Army in Active Service."

The First Vice Presidency was filled, as was anticipated, by the election of Rear Admiral Presley Marion Rixey, whose work, as Chief of the Bureau of Medicine and Surgery, has been marked by characteristics so progressive as to render it of the highest value, not only to his own Corps, but to naval medicine in general. Admiral Rixey



Dr. George Tully Vaughan,
Second Vice President.

body, notwithstanding the fact of his formal separation from its membership. Dr. Vaughan has been one of the most active and efficient friends of the Association, and its members are glad to see him honored by his Corps and pressed forward as its official representative.

The Third Vice Presidency comes this year to the National Guard and much interest was manifested in the choice of the candidates for this position. A number of states had favorite sons, any one of whom would have reflected great credit upon the Association. In the Nominating Committee the representa-



Colonel Joseph K. Weaver, N.G. Pa.
Third Vice President.

tives of the national services stood aside from active participation, agreeing to endorse whatever candidate should be the selection of the representatives of the several states. Their choice, after the way was cleared by several preliminary ballots, fell upon Colonel Joseph K. Weaver of Pennsylvania, one of the oldest members of the Association, his connection with which dates from April 20, 1892, and whose fourteen years relations with the organization have been charac-

terized by dignity, loyalty, activity and efficiency. During that period he has progressed in his own state through the grades of Brigade Surgeon—Major—and Division Surgeon—Lieutenant Colonel—to that of Surgeon General of his state. He is an administrative officer of high ability, as has been shown in many capacities. His work in the Association has been of an equally high grade and the National Guards are to be congratulated upon their representative.

It hardly seems worth while to repeat at this point the annual assurance of an intention to continue advancing the work of



Major James Evelyn Pilcher,
Secretary and Editor.

the Association upon the part of the Secretary and of the Treasurer. The duties of both of these offices have been quintupled since they were first undertaken. The increased membership of the Association, which has doubled and redoubled again and again, adds greatly to the labors of their positions. The maintenance of the reputation to which the Association has attained adds vastly to the thought and consideration demanded of every movement in its work which imposes much upon them. This work is shown however in outline in their annual reports and

the Association may be assured of an earnest continuation of their labors.

With the officers elected the Association is assured of a prosperous year and an advance along all the lines over which its usefulness extends.

The field of study of the Military Surgeon has been shown by recent developments to be surprisingly wide, a fact which has been brought out in America chiefly by the Association of Military Surgeons. In its efforts to develop military medical science, no opportunity will be neglected, and the highest grade of work will continue to be encouraged regardless of rank or service.



Major Herbert Alonzo Arnold, Treasurer.

News of the Services.

THE following officers of the several services named were made members of the Association of Military Surgeons of the United States at the annual meeting recently held in Buffalo, New York.

ACTIVE MEMBERS. UNITED STATES ARMY.

Captain Ernest Lewis Ruffner, U. S. Army.
Lieutenant George H. Scott, U. S. Army.
Contract Surgeon Clarence Allen Warwick, U. S. Army.

UNITED STATES NAVY.

Assistant Surgeon (Lieutenant j. g.) Fletcher H. Brooks, U. S. Navy.

PUBLIC HEALTH AND MARINE HOSPITAL SERVICE.

Assistant Surgeon Eugene Hagan Mullan, P.H. & M.H.S.
Assistant Surgeon Egil T. Olsen, P.H. & M.H.S.
Acting Assistant Surgeon William A. Parris, P.H. & M.H.S.
Passed Assistant Surgeon Clarence Waldemar Wille, P.H. & M.H.S.

THE NATIONAL GUARD.

Captain Edwin L. Bebee, N.G. New York.
Captain Fred H. Clark, Oklahoma N.G.
Lieutenant Colonel Charles S. Huffman, Kansas N.G.
Major Charles LeBaron, Mississippi N.G.
Captain Alexius McGlannan, Maryland N.G.
Captain John T. McLean, Mississippi N.G.
Captain John L. Macumber, N.G. New York.
Major E. L. Martindale, Iowa N.G.
Lieutenant Stewart A. Milliken, New Mexico N.G.
Lieutenant Robert H. Pretlow, Virginia N.G.
Lieutenant A. Avery Rittenour, Virginia N.G.
Major Harry H. Snively, Ohio N.G.
Major Ralph W. Stewart, Ohio N.G.
Lieutenant Louis L. Syman, Ohio N.G.
Lieutenant J. L. Van Gorden, Iowa N.G.

ASSOCIATE MEMBERS.

*Major Charles H. Andrews, U. S. Volunteers.
*Contract Surgeon Henry H. Bradley, U. S. Army.
*Major George Washington Barr, U. S. Volunteers.
*Major Frank Bruso, U. S. Volunteers.
*Lieutenant Colonel Floyd S. Crego, N.G. New York.
*Acting Assistant Surgeon John Hudson Grant, U. S. Army.
*Major Joseph Bascom Griswold, U. S. Volunteers.
*Captain George Wright Pattison, N.G. New York.
*Captain Leon Joseph Roth, California N.G.
*Captain Edward Archibald Southall, U. S. Volunteers.
*Lieutenant Charles Albert Wall, N.G. New York.

*Not now in active service.

CORRESPONDING MEMBERS.

Staff Surgeon Arthur Gaskell, R.N.
 Colonel Ramon Bengoechea, Guatemalan Army.
 Captain Chou Kwei-Sheng, Chinese Army.
 Major William Henry Delaney, Canadian A.M.S.
 Major E. B. Echlin, Canadian A.M.S.
 Major William Henry Wilson Elliot, Indian, M.S.
 Colonel Erast Felicianovich Gorbacevich, Russian Army.
 Colonel William Grant Macpherson, R.A.M.C.
 Lieutenant J. Lisandro Medina, Nicaraguan Army.
 Lieutenant Colonel George Hugh Parke, Canadian A.M.S.
 Stabsarzt Dr. Theodor A. Schaefer, Prussian Army.
 Major Tehan Shih-hua, Chinese Army.

HONORARY MEMBER.

Major George Henderson, District of Columbia N.G.

Assistant Surgeon A. H. Allen, U.S.N., ordered to the Naval Medical School.

Assistant Surgeon M. H. Ames, U.S.N., ordered to the Naval Medical School.

Passed Assistant Surgeon J. F. Anderson, P.H.&M.H.S., detailed as temporary Chairman of the Typhoid Fever Board for the District of Columbia.

Captain Bailey K. Ashford, U.S.A., ordered to accompany troops from Mount Gretna to Washington Barracks.

Assistant Surgeon F. A. Ashford, P.H.&M.H.S., ordered from Ellis Island to Philadelphia for temporary duty.

Passed Assistant Surgeon F. A. Asserson, U.S.N., ordered to the *Columbia*.

Surgeon H. W. Austin, P.H.&M.H.S., ordered from Detroit, Mich., to San Francisco, Cal.

Dr. C. L. Baker, U.S.A., granted one month's extension of leave.

Acting Assistant Surgeon M. C. Baker, U.S.N., ordered to the Newport Naval Hospital, and thence to the Naval Medical School.

Surgeon G. H. Barber, U.S.N., ordered from the *Wisconsin* to the Olongapo Naval Station.

Captain C. J. Bartlett, U.S.A., ordered from the camp of instruction, Murray, Wash., to report to the Commanding General, Dept. of California.

Surgeon William Hemphill Bell, U.S.N., ordered from the *Nevada* home to wait orders; and to report to the Surgeon General for special duty.

Medical Inspector Henry G. Beyer, U.S.N., ordered from the *Ohio* to the *Rainbow*.

Passed Assistant Surgeon W. C. Billings, P.H.&M.H.S., ordered from duty on the U.S.S. *Rush* to Vancouver, B.C.

Acting Assistant Surgeon W. H. Block, U.S.N., ordered from the New Orleans Naval Recruiting Station to Naval Recruiting Party No. 4.

Passed Assistant Surgeon F. M. Bogan, U.S.N., ordered from the *Marietta* to the New York Naval Hospital for treatment.

Captain Perry L. Boyer, U.S.A., ordered from the camp of instruction Austin, Tex., to accompany troops to Fort Sam Houston.

Captain Louis Brechemin, Jr., U.S.A., ordered from the camp of instruction at American Lake to Seattle for duty on the transport *Buford*.

Assistant Surgeon F. H. Brooks, U.S.N., ordered from the *Columbia* to the Newport Naval Hospital for treatment.

Assistant Surgeon H. L. Brown, U.S.N., ordered from the Washington Navy Yard to the Pittsburg Naval Recruiting Station, thence home to wait orders.

Assistant Surgeon J. L. Brown, U.S.N., ordered to duty with Recruiting Party No. 3.

Assistant Surgeon H. Butts, U.S.N., ordered to the Naval Medical School.

Dr. C. R. Byars, U.S.A., ordered from Jefferson Barracks on practice march with squadron of cavalry; returned to Jefferson Barracks from practice march; ordered from Jefferson Barracks to Fort Ethan Allen.

Surgeon D. A. Carmichael, P.H.&M.H.S., appointed delegate to the meeting of the Association of Military Surgeons at Buffalo.

Dr. W. E. Cass, U.S.A., ordered to temporary duty at Fort Worden.

Dr. Charles A. Cattermole, U.S.A., ordered from Manhattan, Nev., to the Philippines.

Captain W. P. Chamberlain, U.S.A., granted two months leave.

Acting Assistant Surgeon F. D. Chappellear, U.S.N., ordered to the Naval Medical School.

Dr. A. M. Chase, U.S.A., ordered with troops from the camp of instruction near Austin to Fort Reno.

Passed Assistant Surgeon Taliaferro Clark, P.H.&M.H.S., granted two months leave.

Assistant Surgeon I. F. Cohen, U.S.N., ordered to the Naval Medical School.

Passed Assistant Surgeon G. M. Corput, P.H.&M.H.S., granted one month's leave.

Captain George H. Crabtree, U.S.A., promoted from First Lieutenant.

Passed Assistant Surgeon H. S. Cumming, P.H.&M.H.S., granted one month's leave.

Acting Assistant Surgeon E. E. Curtis, U.S.N., ordered to the Naval Medical School.

Surgeon L. W. Curtis, U.S.N., ordered from the *Pensacola* home to wait orders.

Dr. William O. Cutliffe, U.S.A., granted three months leave from the Philippines.

Captain Carl R. Darnall, U.S.A., ordered to inspect the new sanitary methods and appliances at Fort Riley, Kans.

Dr. O. F. Davis, U.S.A., ordered from Fort Des Moines to the camp of instruction near Fort D. A. Russell and return.

Dr. G. W. Daywalt, U.S.A., granted one month's extension of sick leave.

Assistant Surgeon F. W. S. Dean, U.S.N., ordered to the New York Navy Yard: ordered from the Denver Naval Recruiting Station to Washington for promotion examination, thence to wait orders.

Assistant Surgeon J. P. DeBruler, U.S.N., ordered to report to the Surgeon General for special duty.

Major George D. Deshon, U.S.A., ordered from Fort Des Moines to accompany troops to the Fort Riley camp of instruction.

Assistant Surgeon P. T. Dessez, U.S.N., ordered from the *Severn* home to wait orders.

Acting Assistant Surgeon H. L. Dollard, U.S.N., ordered to the Naval Medical School.

Assistant Surgeon B. H. Dorsey, U.S.N., ordered to the Des Moines Naval Recruiting Station.

Assistant Surgeon J. O. Downey, U.S.N., ordered to the Philadelphia Naval Hospital, and thence to the Naval Medical School.

Medical Inspector N. H. Drake, U.S.N., ordered from the New York Naval Hospital to Washington for examination for retirement, thence home to wait orders.

Assistant Surgeon J. R. Dykes, U.S.N., ordered from the New York Navy Yard to the New Orleans Recruiting Station.

Passed Assistant Surgeon B. H. Earle, P.H.&M.H.S., ordered from Columbia River Quarantine to Charleston, S.C.

Captain B. J. Edger, U.S.A., arrived at Fort Reno with troops from Fort Brown.

Surgeon M. S. Elliott, U.S.N., ordered from the *Florida* to the *St. Louis*.

Assistant Surgeon W. G. Farwell, U.S.N., ordered from the *Worden* to the *Connecticut*.

Captain P. C. Fauntleroy, U.S.A., detailed to represent the Army Medical Department at the Buffalo meeting of the Military Surgeons.

Lieutenant J. D. Fife, U.S.A., ordered from Fort Slocum, N.Y., with recruits to Boise Barracks, Idaho, and to accompany troops from Fort Slocum to Fort Mackenzie.

Passed Assistant Surgeon C. N. Fiske, U.S.N., ordered from the *Marblehead* to the *Yorktown*.

Assistant Surgeon J. Flint, U.S.N., ordered to the Naval Medical School.

Assistant Surgeon P. E. Garrison, U.S.N., ordered to the Naval Medical School.

Surgeon James M. Gassaway, P.H.&M.H.S., ordered from St. Louis to Philadelphia.

Passed Assistant Surgeon A. J. Geiger, U.S.N., ordered to the Mare Island Naval Hospital.

Assistant Surgeon J. E. Gill, U.S.N., ordered on temporary duty at the St. Louis Naval Recruiting Station, thence to the Washington Navy Yard.

Passed Assistant Surgeon M. W. Glover, P.H.&M.H.S., ordered from Vancouver, B.C., to Sitka, Alaska, for duty on the U.S.S. *Rush*.

Assistant Surgeon J. E. Gill, U.S.N., ordered on temporary duty at the St. Louis Naval Recruiting Station, thence to the Washington Navy Yard.

Surgeon John Godfrey, P.H.&M.H.S., ordered before the board for physical examination.

Dr. Verdo B. Gregory, U.S.A., granted three months leave with permission to visit the United States.

Assistant Surgeon C. C. Grieve, U.S.N., ordered to the Omaha Naval Recruiting Office.

Surgeon E. J. Grow, U.S.N., ordered from the *Mohican* to the *Ohio*.

Passed Assistant Surgeon S. B. Grubbs, P.H.&M.H.S., ordered from Cleveland, O., to Detroit, Mich., for temporary duty, and from Detroit to St. Louis.

Surgeon G. M. Guiteras, P.H.&M.H.S., ordered to rejoin station at Cairo, Ill.

Lieutenant John W. Hanner, U.S.A., ordered to accompany West Point cadets on practice march.

Dr. Herbert I. Harris, U.S.A., ordered to accompany troops from Fort Riley to Fort Snelling.

Colonel Valery Howard, U.S.A., detailed to represent the Army Medical Department at the Buffalo meeting of the Military Surgeons, and ordered to inspect the new sanitary methods and appliances at the camps of instruction at Mount Gretna, Pa. and Fort Benjamin Harrison, Ind.

Colonel Valery Howard, U.S.A., President of the Association of Military Surgeons, has been detailed as Chief Surgeon of the army of occupation in Cuba.

Assistant Surgeon J. P. Haynes, USN., ordered to the Naval Medical School.

Captain George P. Heard, U.S.A., ordered from Fort Wingate to the camp of instruction near Fort D. A. Russell.

Medical Inspector C. T. Hibbett, U.S.N., ordered to the *Franklin*.

Passed Assistant Surgeon J. M. Holt, P.H.&M.H.S., ordered from San Francisco to the Columbia River Quarantine Station, Astoria, Oreg.

Acting Assistant Surgeon J. Spencer Hough, P.H.&M.H.S., granted one month's leave.

Passed Assistant Surgeon R. E. Hoyt, U.S.N., ordered to the Naval Academy.

Acting Assistant Surgeon E. P. Huff, U.S.N., appointed August 30, 1906, ordered to the New York Naval Hospital; and ordered to the Naval Medical School.

Lieutenant P. W. Huntington, U.S.A., ordered from Fort Rosecrans to the camp of instruction, American Lake, Wash.

Passed Assistant Surgeon J. H. Iden, U.S.N., ordered to the *Florida*, from the *Florida* home to wait orders, and ordered to the *Newark*.

Surgeon Fairfax Irwin, P.H.&M.H.S., ordered from Philadelphia to Detroit.

Dr. F. E. Jenkins, U.S.A., ordered from San Francisco to Manila.

Acting Assistant Surgeon A. McK. Jones, U.S.N., ordered to the Norfolk Naval Hospital, and thence to the Naval Medical School.

Assistant Surgeon E. L. Jones, U.S.N., ordered from the Mare Island Naval Hospital to the Naval Medical School.

Dr. E. H. Jordan, U.S.A., ordered from Denver to San Francisco, and from San Francisco to Manila.

Assistant Surgeon J. B. Kaufman, U.S.N., ordered to the Naval Medical School.

Major Jefferson R. Kean, U.S.A., has been ordered by telegraph to proceed to Havana for special duty with the Secretary of War in connection with the occupation of Cuba.

Surgeon R. M. Kennedy, U.S.N., ordered from the *Missouri* to the Bureau of Medicine and Surgery.

Acting Assistant Surgeon W. A. Kimmet, P.H.&M.H.S., granted one month's leave.

Surgeon C. P. Kindleberger, U.S.N., ordered from the Olongapo Naval Station to the *Baltimore*.

Passed Assistant Surgeon W. A. Korn, P.H.&M.H.S., ordered from Perth Amboy, N.J., to the Reedy Island Quarantine Station.

Assistant Surgeon W. S. Kuder, U.S.N., ordered to the Naval Medical School.

Passed Assistant Surgeon C. H. Lavinder, P.H.&M.H.S., granted one month's leave.

Assistant Surgeon A. E. Lee, U.S.N., ordered from the Mare Island Naval Hospital to the Naval Medical School.

Dr. J. F. Leeper, U.S.A., returned to Fort Duchesne from camp of instruction near Fort D. A. Russell.

Captain William F. Lewis, U.S.A., ordered from Chicago to Fort Sheridan for temporary duty.

Acting Assistant Surgeon R. I. Longabaugh, U.S.N., ordered to the Mare Island Naval Hospital, and thence to the Naval Medical School.

Lieutenant R. C. Loving, U.S.A., granted one month's leave from the Philippines.

Surgeon G. P. Lumsden, U.S.N., ordered from the *Minneapolis* home to wait orders.

Passed Assistant Surgeon L. L. Lumsden, P.H.&M.H.S., leave reduced from two months to one month.

Captain Theodore C. Lyster, U.S.A., on leave from the Canal Zone.

Captain William J. Lyster, U.S.A., granted three months leave.

Dr. F. M. McCallum, U.S.A., granted one month's leave.

Passed Assistant Surgeon G. W. McCoy, P.H.&M.H.S., granted two months leave.

Assistant Surgeon F. H. McKeon, P.H.&M.H.S., ordered from Columbia River Quarantine Station to San Francisco.

Passed Assistant Surgeon A. J. McLaughlin, P.H.&M.H.S., granted one month's leave.

Dr. Fred S. Macy, U.S.A., ordered from Fort Ethan Allen to Fort Adams.

Medical Director R. A. Marmion, U.S.N., placed on the retired list, September 6, 1906.

Major Charles F. Mason, U.S.A., ordered to inspect the new sanitary methods and appliances at Camp Chickamauga, Ga.

Passed Assistant Surgeon G. M. Mayers, U.S.N., ordered from the Washington Navy Yard to the *Marietta*.

Surgeon F. W. Mead, P.H.&M.H.S., ordered to Savannah, Ga., and granted one month's leave.

Dr. J. A. Mead, U.S.A., returned to Watertown Arsenal from leave.

Assistant Surgeon J. B. Mears, U.S.N., ordered from the *Minneapolis* to the *Worden*.

Captain E. W. Miller, U.S.A., ordered from the camp of instruction near Austin, Tex., to accompany troops to Fort Clark.

Assistant Surgeon William W. Miller, P.H.&M.H.S., appointed September 4, 1906, and ordered to Ellis Island.

Assistant Surgeon J. M. Minter, U.S.N., ordered to the Norfolk Naval Hospital, and to the Naval Medical School.

Surgeon J. M. Moore, U.S.N., ordered from the *Puritan* to the *Franklin*, and from the *Franklin* to the *Newark*.

Assistant Surgeon C. B. Munger, U.S.N., ordered to Guam.

Passed Assistant Surgeon J. F. Murphy, U.S.N., ordered from the Omaha Naval Recruiting Office to the *Georgia*.

Captain R. E. Noble, U.S.A., granted one month's extension of leave.

Surgeon O. D. Norton, U.S.N., ordered from the *Yankee* to the *Missouri*.

Captain R. P. O'Connor, U.S.A., granted one month's leave.

Passed Assistant Surgeon H. E. Odell, U.S.N., ordered from the *Galveston* to the *Wisconsin*.

Assistant Surgeon G. M. Olson, U.S.N., ordered from the *Wisconsin* to the *Galveston*.

General Robert M. O'Reilly, U.S.A., has been redetailed as Surgeon General of the Army. He will serve until January 14, 1909, when his tour will be terminated by reason of the age limit.

Brigadier General Charles Page, U.S. Army, Retired, an Honorary Member of this Association, died at his home in Baltimore, Md., September 14, 1906.

Passed Assistant Surgeon J. H. Payne, Jr., U.S.N., ordered from the *Arkansas* home to wait orders.

Assistant Surgeon T. N. Pease, U.S.N., resignation accepted, August 21, 1906.

Surgeon H. T. Percy, U.S.N., ordered from the Yokohama Naval Hospital home to wait orders.

Captain J. M. Phalen, U.S.A., ordered from the camp of instruction near Austin to his station at Fort Logan H. Roots.

Lieutenant O. W. Pinkston, U.S.A., ordered to accompany troops from the camp of instruction at Fort Riley to Osawatimie, Kans.

Dr. E. H. Porter, U.S.A., relieved from duty in the Philippines and ordered to Fort Reno for temporary duty and ordered from Fort Reno to Fort Logan H. Roots for temporary duty.

Dr. Arthur D. Prentice, U.S.A., ordered from the Philippines to San Francisco.

Captain H. S. Purnell, U.S.A., granted one month's extension of leave.

Assistant Surgeon T. W. Raison, U.S.N., ordered to the Naval Medical School.

Passed Assistant Surgeon J. A. Randall, U.S.N., ordered to the Denver Naval Recruiting Station.

Assistant Surgeon R. C. Ransdell, U.S.N., ordered to the Naval Medical School.

Acting Assistant Surgeon S. A. Ransom, P.H.&M.H.S., granted three months leave.

Acting Assistant Surgeon F. A. Richardson, U.S.N., ordered home to wait orders.

Dr. G. H. Richardson, U.S.A., ordered to Seattle from the Presidio of Monterey for temporary duty.

Dr. W. H. Richardson, U.S.A., returned to the camp of instruction at Fort Benjamin Harrison and assigned to duty with troops at Michigan City, Ind.

Surgeon C. E. Riggs, U.S.N., ordered from the New York Navy Yard to the *Pensacola* with additional duty at the San Francisco Naval Station.

Surgeon General Presley Marion Rixey, U.S.N., has returned to Washington after an inspection trip around the world. Admiral Rixey visited the Naval Stations and Hospitals at Honolulu, Nagasaki, Cavite, Canacao, Olongapo, and on his return touched at Paris and London where he made important observations.

Captain C. P. Robbins, U.S.A., ordered from Mount Gretna to Madison Barracks with troops, and thence to his station at Fort Ethan Allen.

Assistant Surgeon A. H. Robnett, U.S.N., ordered to the Naval Medical School.

Assistant Surgeon William Colby Rucker, P.H.&M.H.S., appointed delegate to the Buffalo meeting of the Association of Military Surgeons.

Dr. Joseph L. Sanford, U.S.A., granted one month's leave from the Philippines, and one month's extension of leave.

Acting Assistant Surgeon W. L. Savage, P.H.&M.H.S., granted one month's leave.

Surgeon H. W. Sawtelle, P.H.&M.H.S., ordered before a board of medical officers for physical examination and placed on waiting orders from September 5, 1906.

Assistant Surgeon W. F. Schaller, U.S.N., ordered to the Naval Medical School.

Lieutenant George H. Scott, U.S.A., ordered for temporary duty at Fort D. A. Russell.

Captain Hugh Scott has been appointed Assistant Surgeon Oklahoma National Guard.

Assistant Surgeon F. E. Sellers, U.S.N., ordered from the *Ohio* to the *Mohican*.

Passed Assistant Surgeon William Shannon, U.S.N., ordered from the Boston Navy Yard to the *Prairie*.

Dr. J. E. Shellenberger, U.S.A., ordered from the camp of instruction near Austin, Tex., to Fort Sam Houston for medical treatment, and granted three months sick leave.

Assistant Surgeon F. C. Smith, P.H.&M.H.S., ordered from Detroit, Mich., to the Perth Amboy Quarantine Station, N.J.

Assistant Surgeon H. L. Smith, U.S.N., ordered to the Naval Medical School.

Surgeon Raymond Spear, U.S.N., ordered from the *Baltimore* to the Canacao Naval Hospital.

Acting Assistant Surgeon W. G. Steadman, Jr., U.S.N., ordered to the Naval Medical School.

Medical Inspector J. M. Steele, U.S.N., ordered to the Cleveland, Ohio, naval recruiting office.

Captain Samuel L. Steer, U.S.A., granted one month's leave.

Surgeon G. W. Stoner, P.H.&M.H.S., ordered to Washington for temporary duty and return.

Lieutenant Colonel Blair D. Taylor, U.S.A., has been detailed as Medical Inspector of the army of occupation in Cuba.

Assistant Surgeon E. C. Taylor, U.S.N., ordered to the *Hancock*.

Dr. W. C. Thorp, U.S.A., returned to Fort Ethan Allen from leave.

Lieutenant Colonel George H. Torney, U.S.A., ordered to escort insane soldiers from the Presidio of San Francisco to the Government Hospital at Washington, and to return.

Dr. C. A. Treuholtz, U.S.A., ordered from Fort Bayard to Fort Apache for temporary duty.

Dr. H. H. Van Kirk, U.S.A., granted one month's leave.

Major Philip G. Wales, U.S.A., ordered to Fort Wayne.

Medical Director Philip S. Wales, U.S. Navy, Retired, who was Surgeon General of the Navy from 1880 to 1884, at which time he reverted to the rank of Medical Director, died in Paris, France, September 15, 1906. He was the father of Major Philip G. Wales, U.S. Army.

Captain Freeman B. Walker, U.S.A., who was wholly retired in December, 1905, having been reappointed by authority of a special Act of Congress has been placed upon the retired list, August 20, 1906.

Assistant Surgeon Robert A. C. Wallenberg, P.H.&M.H.S., appointed September 4, 1906, and ordered to Detroit, Mich.

Captain S. M. Waterhouse, U.S.A., ordered from Fort Worden to the camp of instruction, American Lake, Wash.

Surgeon A. R. Wentworth, U.S.N., ordered to the *Louisiana*.

Surgeon Charles Poindexter Wertenbaker, P.H.&M.H.S., appointed delegate to the Buffalo meeting of the Association of Military Surgeons.

Lieutenant A. M. Whaley, U.S.A., granted one month's leave from the Philippines.

Surgeon J. H. White, P.H.&M.H.S., ordered to Mobile, Ala., and Natchez, Miss., for special temporary duty and return to New Orleans.

Assistant Surgeon C. K. Winn, U.S.N., ordered to the Naval Medical School.

Surgeon R. M. Woodward, P.H.&M.H.S., appointed delegate to the British Medical Association Meeting at Toronto.

ARMY MEDICAL DEPARTMENT APPOINTMENTS.—The following candidates have been successful in passing the preliminary examination for admission to the Army Medical Department and will be appointed Contract Surgeons and ordered to the Army Medical School for instruction: Dr. Egbert W. Bell, of Illinois, Dr. Henry C. Pillsbury, of Massachusetts, Dr. Frederick S. Macy, of Massachusetts, Dr. William H. Richardson, of Ohio, Dr. William K. Bartlett, of Minnesota, Dr. B. H. Gostin, of Georgia and Dr. Edgar King, of Arkansas.

HOSPITAL CORPS OF THE OKLAHOMA NATIONAL GUARD.—The Hospital Corps of the Oklahoma National Guard is organized in a single body stationed at the home of the commanding officer. Captain F. H. Racer, recently Commandant, having been promoted to Regimental Surgeon, the Hospital Corps organized at Woodward, his home, has been mustered out, and a new Corps has been ordered enlisted at El Reno, the home of Captain F. H. Clark, who has been commissioned commanding officer.

Current Literature.

A HANDBOOK FOR THE HOSPITAL CORPS.*

THE work of the Army Hospital Corps has now been sufficiently well developed to render possible the preparation of a handbook for the instruction of its members, and the accomplished author of the new book, just issued, is eminently qualified to do the work, as is shown by the admirable treatise he has provided. It is comprised in twelve parts, (1) the hospital corps in post and field; (2) anatomy and physiology; (3) first aid in injury and disease; (4) nursing; (5) mess management and cooking; (6) materia medica, therapeutics and pharmacy; (7) hygiene; post and camp sanitation; (8) riding, packing and driving; (9) army regulations; (10) clerical work; (11) minor surgery; (12) hospital corps drill regulations. Each of these subjects is taken up with ample fulness and explained distinctly and simply. The book is much more complete and extended than the similar works prepared for the use of the enlisted force of the Medical Department of any other Army, and should prove ample for the instruction of the Corps. The inclusion of portions of the cavalry drill regulations in the section on packing and driving provides a fund of information upon the subject of the care of animals, their equipment and appendages which is of great advantage. The chapter on disease prevention is an interesting one and particularly well put, while that on post and camp sanitation cannot be too highly praised. The Hospital Corps and those officers whose duty it becomes to take part in its instruction are to be heartily congratulated on the possession of a textbook of so high a character.

*A Complete Handbook for the Hospital Corps of the U. S. Army and Navy and State Military Forces. By Major CHARLES FIELD MASON. 8vo; pp. 545, with numerous illustrations. New York, William Wood & Co., 1906.

THE CARE OF THE HEALTH OF THE ARMY.

A GUIDE for officers, medical officers and students, by Dr. Hiller, chief staff surgeon of the German service is just published by Hirschwald in the Bibliothek von Coler. The work includes twelve chapters, including a study of feeding of troops in general, comparisons of different rations; he emphasizes the value of sugar in energizing soldiers, and recommends its use freely in tea and coffee. III and IV treat of clothing and equipment. V and VI cover protection and quarters for the soldiers. VIII to XI treat of practical hygiene in home and foreign service. Also cover fully sterilization of water for drinking.

ALKALOIDAL DIGEST.*

A CONVENIENT digest of the principal facts concerning alkaloids has been issued under the editorship of Dr. W. C. Abbot, whose great interest in the subject has made itself felt in so many directions. The book is a most interesting therapeutic implement and will be found of great advantage to the practitioner.

SURGICAL SUGGESTIONS.†

THIS is a convenient little book containing in pithy and explicit form many facts liable to escape the attention of a practitioner in connection with surgical work. The text is arranged topographically and is easy of access, the whole forming a handbook of the very greatest service, particularly to the young surgeon or to the practitioner whose surgical work is only an occasional event. The broad margins, red catch lines, and handsome typography add much to the acceptability of the work.

***Abbott's Alkaloidal Digest.** By W. C. ABBOTT, M.D. 12mo; pp. 258; Chicago, The Clinic Publishing Co., 1906.

†**Surgical Suggestions.**—*Practical Brevities in Surgical Diagnosis and Treatment.* By WALTER M. BRICKNER M.D. and ELI MOSCHCOWITZ, M.D. 12mo; pp. 60. New York, Surgery Publishing Co., 1906.

HEATH'S MINOR SURGERY.*

HHEATH'S Minor Surgery has been so long a standard that it is pleasant to observe that it is being kept up to date by means of new editions issued from time to time. The present edition is edited by Mr. Bilton Pollard, who was requested by Mr. Heath to undertake it before his greatly regretted demise. The work has been thoroughly and excellently done, and the book still stands as a model of its kind.

YEAR BOOK OF THE EYE, EAR, NOSE AND THROAT.†

THE volume of the Practical Medicine Series for 1906, devoted to the eye, ear, nose and throat, is a valuable summary of the professional work done in the fields covered, and will be found of much service to the profession.

THE PROSTATE GLAND.‡

THE little work of Dr. Overall has evidently found a vacancy in medical literature, having reached its third edition in so brief a time. The present edition is thoroughly revised and well illustrated and of interest because of the unusual aspect in which he presents the subject.

INTERNATIONAL CLINICS.§

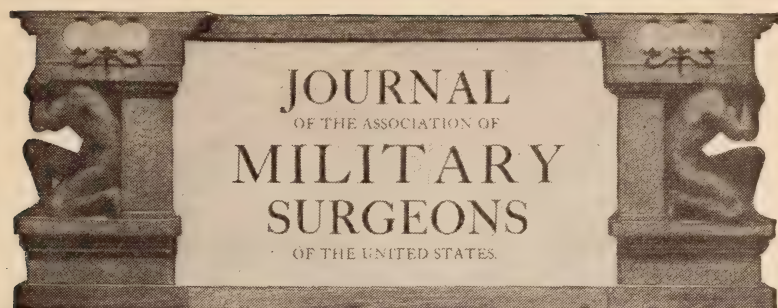
THE second volume of the sixteenth series of the International Clinics comprises many articles of interest in the realms of treatment, medicine, pediatrics, neurology, surgery, diseases of the female and laryngology, all of which are of exceptional value and many of which are profusely illustrated.

**Heath's Minor Surgery and Bandaging. Thirteenth edition.* Revised by BILTON POLLARD, F.R.C.S. 12mo; pp. 407, with 198 illustrations. Philadelphia, P. Blakiston's Son & Co., 1906.

†*The Eye, Ear, Nose and Throat.* Edited by CASEY A. WOOD, ALBERT H. ANDREWS, GUSTAVUS P. HEAD. Vol. iii. of the Practical Medicine Series. 8vo; pp. 368, with numerous illustrations. Chicago, The Year Book Publishers, 1906.

‡*A Non Surgical Treatise on Diseases of the Prostate Gland and Adnexa.* By GEORGE WHITFIELD OVERALL, M.D. Third Edition. Small 8vo; pp. 238. Chicago, Rowe Publishing Co., 1906.

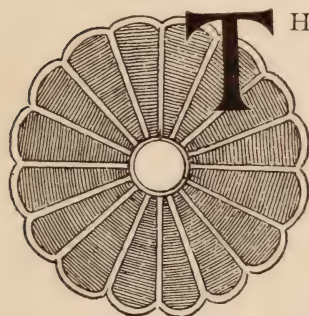
§*International Clinics.* Edited by A. O. J. KELLY, M. D. Sixteenth Series. Vol. ii. 8vo; pp. 302. Philadelphia, J. B. Lippincott Co., 1906.



Original Memoirs.

NOTE ON THE SANITARY CONDITION OF THE IMPERIAL JAPANESE ARMY DURING THE LATE RUSSO-JAPANESE WAR.

By SHIGEMICHI SUZUKI, F.R.S.C. ENG.,
SURGEON GENERAL IN THE IMPERIAL JAPANESE NAVY.



THIS note is written because when I attended the last annual meeting of the Association of Military Surgeons of the United States of America many questions were showered upon me with regard to our Army sanitation. At that time I was not possessed of sufficient knowledge upon the subject to speak freely, so that I declined to answer. I have now received from the Army however reliable statistics which I take pleasure in translating and sending to you.

The duration of the late Russo-Japanese War was one year and nine months; during that time there were many combats of which twenty-one were great battles and more than fifty smaller affairs. The number of the wounded was 220,812 of which 47,367 died. Amongst them nineteen surgeons died and 104

were wounded; 450 Army Medical Corps men were either killed or wounded.

Of the sick 236,223 were admitted to hospital, among them 27,158 infectious cases; this number is small in proportion to that of other diseases. The total number of the sick and wounded was 457,035; this being only the number at the front. Besides these the number of sick at home was 97,850, making a grand total of 554,885. There were also 77,803 wounded and sick among the Russian prisoners, making another grand total of 632,688,—trivial cases treated by divisional surgeons not being included in this total.

The personnel required for attendance upon the foregoing wounded and sick numbered 4,517 Surgeons, 639 Apothecaries and 33,597 Medical Corps men; in addition there were 540 physicians and apothecaries and many thousand nurses from the Japanese Red Cross Society, and volunteer medical men and nurses at home and from abroad lent much needed assistance,—making a ratio of one medical man to 113 patients on the average.

The materials required for the treatment of these patients were furnished from the Army medical supplies; it is said that the suture needles issued numbered 300,000, and the whole expense,—including disinfecting apparatus, etc.,—amounted to 7,100,000 yen. The drugs employed were mostly in the form of tabloids.

The removal of the wounded and sick from the front to the rear was the most important and at the same time most difficult question as their presence at the front interfered greatly with the fighting efficiency by consuming the rations sent to the front with so much difficulty. The wounded were carried either by stretchers or upon wheeled conveyances to the nearest field hospitals, thence again to the second rear hospitals either by rail or water transportation or other means, and thence home by sea.

Of the hospital ships used, eighteen belonged to the Army and two to the Japanese Red Cross Society. Occasionally when they were not sufficient for the purpose, six transports of over 6,000 tons each were employed to convey the lighter cases, and

twice naval hospital ships and surgeons assisted when 10,000 cases accumulated in Dalney.

The results of the treatment of the wounded and sick are not yet completely known as there are cases still remaining in the hospitals, but up to the present date, April, 1906, 63.23 per cent of all the cases admitted recovered completely, and 7.49 died. In peace time recovery is 75 per cent and death 1.18 per cent, so that in this war recovery has been a little less than in peace time, but death is seven times greater. Compared however with the ratio of the Chino-Japanese War (recovery 50.94 per cent, death 14.24 per cent) the result is better.

Among the wounded in the late war recovery was 71.58 per cent and death 6.83 per cent as compared with 54.81 and 7.65 respectively in the Chino-Japanese War.

The principal object of the military surgeons was not only to take care of the wounded and sick, but to keep up the good health of the forces, and to fulfill this important object prevention of infectious diseases was of the utmost importance. And to this the great energy of the sanitary department was devoted.

In February, 1904, several hundred thousand pamphlets describing the care of the body, clothing, food, camp, diseases liable to occur during the march, and infectious diseases, were issued to each soldier, and the division surgeons and other officers endeavored to impress the importance of personal hygiene upon the soldiers; it is believed that this pamphlet was of great benefit as each man paid the most careful attention to personal sanitation as a result of its perusal.

Flies are the worst enemy for the propagation of infectious diseases; to sweep them out several means were resorted to but in vain. After various investigations the only means of exterminating flies was found to be destruction of their eggs by burning up the horse dung and refuse in which their eggs were deposited,—a discovery by means of which the number of flies was greatly reduced.

Every possible article of clothing needed to prevent cold was served out to each man. When hard duty lasted longer than eight hours a day one extra ration was issued.

To prevent kakke (beri-beri) a mixed food consisting of sixteen ounces of rice and eight ounces of barley was given toward the latter part of the war. Boiled rice is very prone to decompose in summer and freeze in winter, making it unfit for consumption; after painstaking investigations, it was determined that if the rice be boiled with a certain amount of vinegar it keeps sweet for about thirty hours without decomposition; to prevent freezing the plan was adopted of enveloping it in a woolen cloth and carrying it under the outer garments. Each man was supplied with an aluminum dish tray in which he could boil rice at any time and have the advantage of warm food.

The paramount importance of good water supply in military sanitation was recognized. How to get river water properly or to extemporaneously filter muddy water was taught in time of peace. Whenever wells were found the water was examined physically as well as chemically; if it was found fit for drinking, notice was given of the fact and sentinels were stationed to protect the wells from indiscriminate use by natives or poisoning by spies.

Drinking unboiled water was strictly forbidden even in peace time and this rule was strenuously applied during the late war. The supply of boiled water was energetically prepared. Each Army established drinking places at suitable distances along the line of communication, at which two or three men were quartered, and boiled water was constantly served day and night. Whoever passed the place was permitted to have a drink and rest on benches; the empty bottles carried by each man were also filled. Moreover, along the lines of communication signs were erected giving the names and distances to drinking places, by which means men were enabled to endure thirst knowing that within a short distance they could obtain wholesome drinks. Care was also paid to erecting signs for the benefit of marching forces, at the entrance of villages indicating the number of houses and their capacity, nature of the well water and the presence or absence of infectious diseases. In the field the supply of boiled water was also well carried out, but the most difficult task met with was to supply the forces in the firing line; even this was se-

cured by boiling water in the tray each man carried with him or by using kettles left by the natives, and later this became easier by the use of boiling water wagons.

In case of deficiency of fuel or strategic reasons for the avoidance of smoke, sterilized water was supplied by the use of a filter invented by Mr. Ishiji. Disinfection of drinking water by harmless chemicals is a very important question in connection with military sanitation. Hitherto numerous experiments have been made, but they were unsuccessful because of destroying the taste of the water or on account of a complicated process unsuited to the field, but the filter of Mr. T. Ishiji (an apothecary) was found to greatly reduce bacteria in water without altering its taste; this was renewed several times and at last a perfect sterilizing filter was made. The sterilizing chemicals do not destroy the taste of the water nor are they injurious to men, while the management of the apparatus is simple and the cost small.

In the field infectious diseases are caught from the natives, whence the detection of native infectious cases is an important duty. Most natives however leave their homes and hide in some unknown place, whence it is almost impossible to find out what kind of infectious diseases are present in any locality. In view of this fact the Army surgeons established dispensaries and invited the natives who suffered from any maladies whatever to seek medical assistance; by this humane means men first came to seek treatment and later even women and children flocked to the dispensaries. In this way the surgeons were enabled to discover any existing infectious diseases and to treat them.

In case of the appearance of typhoid fever, dysentery, etc., in the field, very strict (it might be supposed too severe) management was employed. Daily examination of the healthy forces was performed and if cases doubtful even in the slightest degree were found they were at once isolated; old dirty clothes and bedding were burned or thoroughly disinfected by Hirayama's disinfecting wagon or steam disinfecting apparatus. The ground inside the houses where infectious cases appeared was sprinkled with lime or perchloride solution, walls and ceilings were disinfected with Yonezawa's pump, swabs saturated with carbolic solution were laid in front of the entrance of the house, upon which to

wipe the feet, and latrines were especially disinfected. If the infectious disease did not disappear in spite of the above treatment camps were removed to other healthy places and the infected houses were burned if they were found to be unfit for disinfection.

Disinfection of ships was carried out thoroughly at home harbors. At Ujina and other harbors, a disinfecting party inspected and disinfected every ship coming in from the front. Clothes and bedding were disinfected either by steam or formalin in the quarantine station near by.

Preventive inoculations were not performed except vaccination,—preventive inoculation for typhoid fever, dysentery, cholera and plague not yet being certain. Moreover in Korea and Manchuria besides small pox seven or eight other kinds of infectious diseases were present; seven or eight inoculations upon the men with subsequent possible reaction was out of the question as they must be ready upon a moment's notice to confront the enemy.

The ratio of killed in the field and dead by diseases seems to be taken as the standard of the results of military sanitation in the civilized world. It is stated that the ratio of killed and dead in modern war in Europe is 1 to 1.18, while the result of our late war was 1 to 0.37, therefore our death rate from disease is one-third that of Europe. The ratio of wounded, diseased, killed, and died from disease in the Chino-Japanese War and that of the late war is as follows:

	Chino-Japanese War.	Russo-Japanese War.
Wounded.....	1	1
Diseased.....	6.93	1.15
Killed	1	1
Died from Disease.....	12.09	0.37

The difference in ratio is obvious.

The good result in the late war was principally due to the small number of infectious diseases. Kakke (beri-beri) was a great bother to the Army; about a quarter of all the admitted cases were of this disease. If the Army authorities had tried to prevent the occurrence of kakke among the soldiers as the Japanese naval authorities did many years ago (in the Navy there was practically no kakke during the whole war), the sanitary record of the Army would have been better than that shown above.

ELISHA KENT KANE.—A SKETCH.

By JOHN C. WISE, M.D.

MEDICAL DIRECTOR IN THE UNITED STATES NAVY.

“ON the 12th day of May, while bathing in the tepid waters of the Gulf of Mexico, I received one of those courteous epistles from Washington, which the electric telegraph has made so familiar to naval officers. It detached me from the Coast Survey and ordered me to proceed forthwith to New York, for duty upon the Arctic Expedition.”

The climax of geographical antithesis is reached between the Gulf of Mexico and the North Pole, but it fittingly introduces us to a medical officer, so deeply imbued with a love for the natural sciences, that few of its branches escaped the scrutiny of his inquiry, which led him on cruises at sea, and journeys by land, over remote corners of both continents, including the craters of Luzon, the interior of India and the most remote oceans.

We think of Kane as a man of delicate physique, of a most aristocratic, refined, and magnetic personality.

Elisha Kent Kane, was the eldest son of Judge John Kane and was born in Philadelphia in February, 1820.

Kane was never a strong man, and was unable to elaborate the immense nervous supply, which an active mind demanded of a constitution by no means robust. We can easily comprehend, that the hardships undergone in his short, but brilliant career, would have undermined the health of a much stronger man.

McCallie, tells us that “in his brief span of thirty-seven years,” he visited, and studied nearly every land on the globe.

Kane, though a Pennsylvanian, entered the University of Virginia in 1838; this was doubtless due to an association with Robert Patterson, his cousin (whose father was a Professor of Philosophy in the University) and also in the hope of benefitting his health in a Southern climate. He came to Charlottesville,

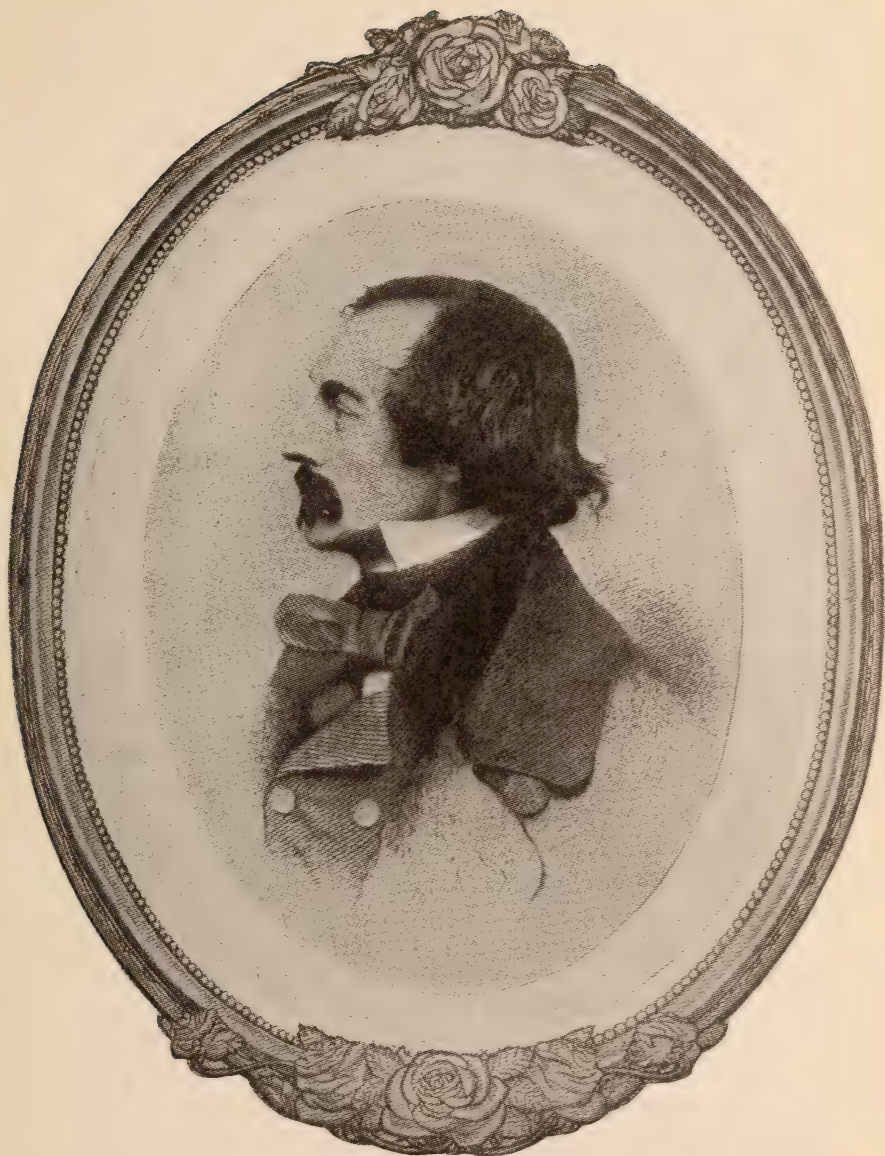
when a lad of about nine years, and entered the University when eighteen, thus practically passing his boyhood in this beautiful mountain region of Virginia. Kane devoted his time principally to the study of Mathematics and Civil Engineering, with a view to adopting the latter avocation. It does not appear that he graduated on these branches, but as he possessed an exceptionally bright mind it is highly probable that it was considered unwise, that he undertake the drudgery of "boning" for an examination, in view of his health. Later Kane took up the study of Natural Philosophy and Geology, which were taught by the distinguished Professor Rogers. From the minutes for July 3, 1839, he is recorded among the students who were "distinguished" in these subjects.

When we read the following from the record of the Faculty, we would wonder how Kane ever became an Artic Explorer, did we not remember his intense scientific enthusiasm. "Mr. Elisha K. Kane made application through the Chairman for leave to occupy a vacant room in the old library" the reason for the request is that the applicant suffers from a rheumatic affection of the heart and that the dormitory he was using was uncomfortable with a smoking chimney compelling him to keep a window open.

Kane left the University of Virginia in 1840, on account of heart disease, but he entered the University of Pennsylvania the same year, where he commenced the study of medicine, graduating in 1842. Soon thereafter Kane entered the Navy as an Assistant Surgeon. From this time on, though laboring under organic disease of the heart, he was an incessant traveler, and though we associate him peculiarly with Arctic explorations, he visited the most inaccessible portions of both the Old and the New World, and many of the islands of the ocean.

In 1843 Kane was appointed physician to the Embassy to China, a detail much suited to his inclination, as it gave him unusual opportunity for travel. En route he was able to explore much of Brazil and the Andes, Ceylon and India, where he inspected the cave-temples of Elora.

It was during this voyage that he visited the Island of Luzon, and descended the crater of Mount Tael, the first for-



Elisha Kent Kane, U.S.N.

eigner to do so. This volcano is still active, and though advised not to descend Kane did so, and when reaching the top, he was almost in a state of unconsciousness.

Today we can look upon this commanding peak, so distinctly seen from Manila Bay, as a fitting monument to the young American officer, and indefatigable explorer.

Ill health necessitated Kane's return in 1844, but on his way home he visited Borneo, Sumatra, Ceylon, the Himalayas, Persia, Syria, Egypt, Greece, Germany, Switzerland, Italy, France and England, devoting himself in every place to a study of its geography, geology, and other scientific features.

The coast of Africa was visited in 1846, when he met the King of Dahomey, a noted slave dealer.

During all these years Kane was overtaxing a naturally delicate constitution, but as yet an indomitable courage, gave his spirit strength to triumph over bodily ailments—for his greatest work was to come.

Again at home when the war with Mexico occurred, and at his own request, Kane was transferred to the Army, and served with much distinction. He saved the lives of two Mexican officers, and while ill in the city of Mexico, was tenderly cared for in one of their families.

We find him at Rio in 1849; going from there to Lisbon and the Mediterranean. He had returned to the naval service in 1850, and while on duty with a vessel surveying the Gulf of Mexico, he received orders to report at New York as the Medical Officer and Naturalist of the Grinnell Expedition, which was soon to sail in search of Sir John Franklin.

Kane in his most valuable and interesting journal tells us that though ordered on "this expedition as its medical officer, I had no claim to be its historian. Such a task belonged strictly to our commander; but he having declined making any other than an official report, I have been invited to prepare a history of the cruise, under the form of a personal narrative," and further with great modesty he adds: "My apology must be that I do not pretend to be accurate but truthful." This narrative is written in a singularly lucid, interesting, and scholarly style, and there

is scarcely any subject relating to the peculiar work of the Expedition, which is not benefitted and elucidated.

In reading it we are assured that our author is a cheerful, resourceful and able man—indeed we clearly discern the liberally educated and charming gentleman as well as the naturalist, throughout these pages. A passage such as this tells strongly of the man's warm heart.

“Of my brother-officers, I cannot say a word, I am so intimately bound to them by the kindly and unbroken association of friend and messmate that I shrink from any other mention of them, than such as my narrative requires.”

Two ships sailed in the Grinnell Expedition, commanded by Lieutenant De Haven, Kane being the medical officer of the *Advance*, and Benjamin Vreeland, Assistant Surgeon, U.S.N., of the *Rescue*.

On his return to the United States in 1853, Kane delivered a series of lectures on the Expedition, devoting the proceeds to the succeeding Expedition, which he had the honor to command. Another journal full of interest and substantial contributions to Arctic science and exploration was the fruit of this last voyage.

But continued hardships had indelibly impressed the noble spirit, and the end of his short life of thirty-seven years was necessarily devoted in efforts to obtain relief for his distressing malady, and to this end he visited England and Saint Thomas. He died at Havana, February 16th, 1857.

Kane received ample recognition of his distinguished service,—medals from Congress, from the New York Legislature, from the Royal Geographical Society, and from the Queen of England.

Let us hope that ere many years pass, his brother officers of the Medical Corps, will see fit to honor themselves, by erecting to his memory, a similar tablet to that placed to another medical officer and Arctic explorer, at the Naval Medical School.

The material for this notice has been gathered from the brochure of James Park McCallie, Kane's Journal, the Encyclopaedia Britannica, and living officers of the Navy.

THE UNITED STATES MARINE HOSPITAL AT SAN FRANCISCO, AND THE GREAT EARTHQUAKE AND FIRE OF 1906.

By HENRY W. SAWTELLE, M.D.

SURGEON IN THE UNITED STATES PUBLIC HEALTH AND MARINE HOSPITAL SERVICE.

IN 1769 two Franciscan fathers discovered the peninsula upon which San Francisco was built, and since that time two destructive earthquakes have occurred in the city, namely, one in 1868 and the other in 1906. The following brief account relative to the recent temblor in connection with the Marine Hospital together with a reference to the general sanitary conditions resulting therefrom may perhaps be of interest. It should be stated first that the old marine hospital on Rincon Point in the lower portion of the city was so badly injured by the earthquake of 1868 that it was condemned as unfit for further use as a hospital and by an Act of Congress it was presented to the city to be used as a Sailor's Home. It still stands, however, uninjured by the recent earthquake.

The present hospital was built in 1873 to replace the original hospital referred to, and is located on the west bank of Mountain Lake about six miles from the water front. The shock came Wednesday morning, April 18, at 5:15 a.m., and continued about forty-five seconds. Those who were awake at the time first heard a short rumbling, something like the sound of rushing squadrons in the distance, instantly succeeded by sharp vigorous vibrations of the earth's surface, resulting in more or less damage to twelve of the thirteen hospital buildings.

As soon as possible a hasty inspection was made and it was ascertained that no one connected with the hospital was seriously hurt. All of the chimneys were demolished, including a small crack in a large brick smoke stack of the power house, and the executive building was moved slightly out of plumb. The

plastering in all of the buildings, the hospital kitchen range, furniture, gas pipes and crockery were broken, but no extensive structural damage to the buildings was found. The injury to the hospital, however, was of little consequence compared with the destruction of property in the city proper, though the casualties were small as the temblor came early in the morning before many people were on the streets—probably about 400 were killed in addition to the large number of injuries. Had it occurred during business hours the loss of life would have been appalling. All telephone and street car lines were stopped, and fire broke out immediately in the lower section of the city which the Fire Department was powerless to control because there was no water, as the water mains had been broken. The fire therefore extended rapidly and the outlook was gloomy for the sorely stricken city. The Marine Hospital Out-patient office with its equipment, located on Market Street was soon after totally destroyed. A momentous exigency confronted the municipal authorities requiring instant action, good judgment and discretion.

The army was called upon for help and responded quickly to the call. The use of dynamite for the destruction of buildings to check the spread of the flames was now the only recourse, and the work was commenced at once under the direction of General Funston. But notwithstanding this heroic work, which was continued for nearly three days and nights, the flames were not brought under control until nearly all of the buildings covering an area of four square miles were destroyed by fire. Meanwhile the sick and wounded had been removed from the city by ambulances, automobiles, and all sorts of vehicles to the temporary hospitals which had been hastily prepared, and the regular hospitals, which were still in use, including the General Hospital at the Presidio, were filled to the limit of their accommodations. There were over one hundred sick and disabled seamen under treatment in the marine hospital at the time; with a view to admitting as many refugees as possible requiring treatment during the emergency, the repair work made necessary by the earthquake was commenced as soon as possible; but, it was found ex-

ceedingly difficult to secure workmen and materials especially to reconstruct the chimneys on account of the chaotic business conditions.

In this connection I desire to express my thanks to General Funston for materials which greatly expedited the work of rebuilding the kitchen chimney which was of vital importance, also for the loan of a pair of mules for ambulance purposes. In a few days the kitchen was in commission, though our supply of rations was small; but relief soon came from various points throughout the country and in due time food supplies were in abundance so that we were able to issue rations to the refugees and other destitute people in the vicinity who called for help. This was continued for several days or until the representatives of the Red Cross Association and officers of the Army assumed charge of the distribution of the "calamity" supplies contributed so promptly and generously. All sick or injured refugees calling for treatment were either admitted to the hospital or treated as out patients. An Assistant Surgeon was detailed to make morning visits to those in tents in the neighborhood for the purpose of extending necessary relief and to vaccinate those who were not properly protected. A heavy responsibility now rested upon the Health Department. With about 200,000 refugees in tents in the Golden Gate Park, Presidio, and other points; the water supply crippled indefinitely by the breakage of water mains, and contamination of nearly all of the water obtainable from all sources, a water famine practically existed, and an epidemic of enteric fever seemed to be imminent. The people were therefore earnestly advised as a precautionary measure to boil all water used for household purposes for the time being.

The large camps concentrated in Golden Gate Park and the Presidio Reservation were kept clean, well drained, and in good sanitary condition under the supervision of medical officers of the Army in cooperation with the municipal health department, which included many of the private physicians of the city who lost all by the great catastrophe, but who remained true to their traditional obligations to humanity. The Hospital Corps of the Oregon National Guard and quite a number of medical gentlemen from Chicago and other points offered their services early and rendered valuable assistance. The inevitable result of such

disasters is long continued suffering which will never be fully known save by the sufferers themselves. On the first of August about fifty thousand refugees were still living in tents and barracks who will probably remain wards of the city for an indefinite period.

With the characteristic devotion to his life work in the field of preventive medicine, the Surgeon General of this Service detailed several medical officers to aid the State and local health officials in connection with their sanitary duties which has been duly acknowledged by the proper officials of the State. Fortunately the great catastrophe occurred during the "dry season;" and with energetic and careful sanitary supervision involving many details of vital and far reaching importance, and withal good weather, no epidemic was realized.

The President of the Board of Health is to be congratulated and all associated with him, for the great work so well performed; and when the history of the great earthquake of 1906 shall have been written, high on the Roll of Honor will be found the names of General Funston, Mayor Schmitz, and Doctor Ward the President of the Board of Health.

SAUSAGE AS A FIELD RATION.

A SPECIALLY-PREPARED meat ration, in sausage form for the British troops is to be tried as a field ration during the present training season. Each tin contains four sausages, wrapped in skin, the weight of each sausage being from seven ounces to seven and three-fourths ounces. Two sausages will thus form one day's ration. The meat is minced and of similar quality to that sold by the leading firms in Australia, in the form of preserved meat. It is free from seasoning. The principal advantage claimed for this ration over the ordinary preserved meat is that a portion of the ration can be consumed, while the remainder may, without deterioration, be taken out of the tin and carried loose in the haversack, to be eaten whenever required. It is, moreover, said to be very palatable, and, owing to the absence of salt and saltpeter in its manufacture, will not cause thirst which usually occurs after eating the ordinary preserved meat. Sausage rations are to be issued to the troops during the maneuvers and training, in lieu of preserved meat.

THE ANATOMICAL CHARACTERS OF OPISTHORCHIS
SINENSIS, AND THE STATISTICS OF ITS OC-
CURRENCE IN THE UNITED STATES.

BY MARK JOHNSTON WHITE, M.D.,

PASSED ASSISTANT SURGEON IN THE PUBLIC HEALTH AND
MARINE HOSPITAL SERVICE OF THE UNITED STATES.

THIS entozoon, commonly designated *Distoma Sinense* or *Distoma Spathulatum*, belongs to the Genus *Opisthorchis* of the *Plathelminthes* class, *Trematoda*.

While of frequent occurrence in Japan, Formosa, Corea, China, India, Tonquin and Mauritius, it is rarely met with on this continent. In 1890, Dr. Herman F. Biggs found the fluke post mortem in the liver of a Chinese laundryman in New York. In 1895, Dr. Wyatt Johnson observed several cases in Montreal. During the plague investigations in California from March, 1901, to December, 1902, I found, post mortem, eighteen infested Chinese, of whom sixteen had died from the effects of bubonic plague, one from chronic valvular heart disease and one, an Alaskan canneryman, from beri-beri. Most of the victims were well-to-do Chinamen of club-life and sporting propensities. Some of them had returned from China two years previously, others were just back from Alaska, while the majority had not been out of the country for twelve years or more. Only mature flukes were found and those were confined to the biliary passages, gall-bladder and intestines in numbers varying from two to eight hundred. Only a few were noticed in the duodenum or gall-bladder, and but shreds of dead ones in the colon. None were seen in the pancreas, spleen or elsewhere in the body. No disposition to penetrate the tissues was demonstrable, the flukes not even adhering to the biliary mucosa. They were free in their probable food supply, the bile.

In the beri-beric and cardiac cases the parasites were alive at autopsy, but plague infection proved to be an energetic para-

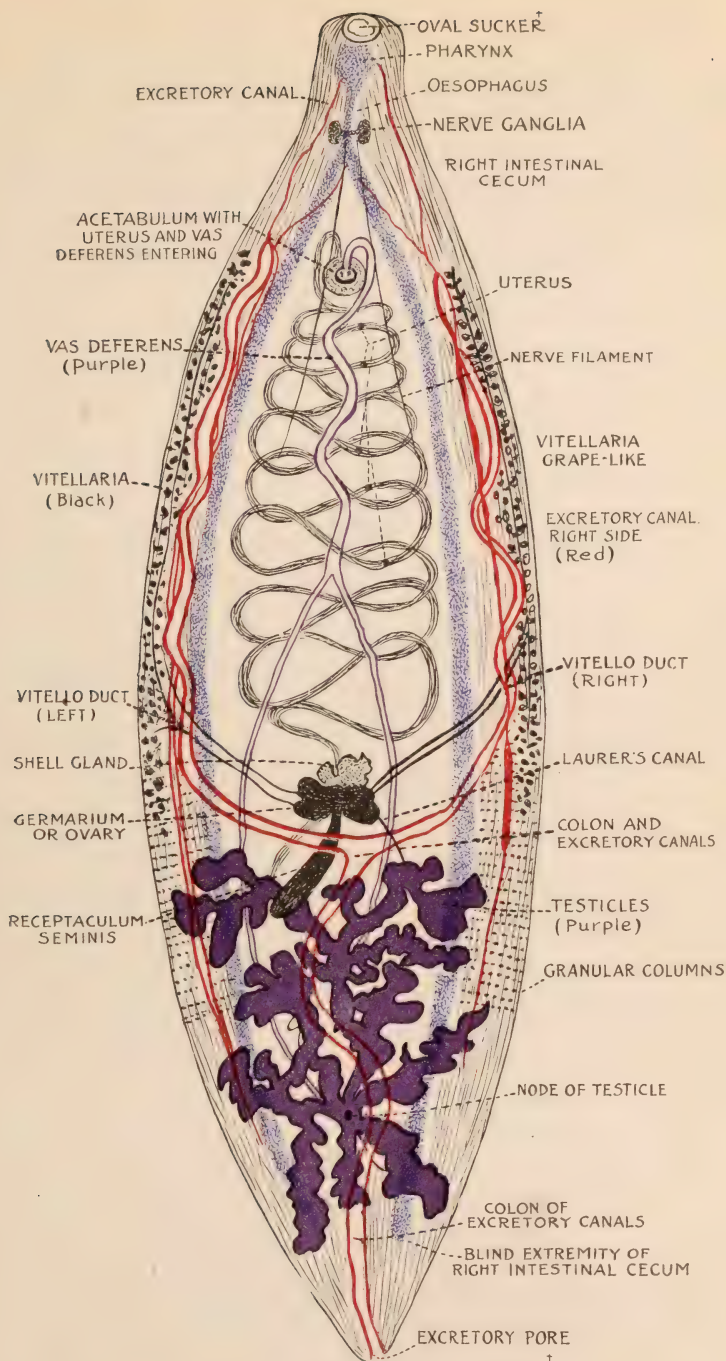


Fig. 1. The Anatomy of the *Opisthorchis Sinensis*.

siticide. Those found dead were dark in color and completely relaxed, while those found alive were reddish-brown and thrown into transverse ridges from longitudinal contraction. When placed in water the anterior one-half half of the body was slowly moved about as if in search of support superiorly, and locomotion was very slow and by squirming.

Apart from the pathological tissue changes that were caused by the coexisting diseases, plague, beri-beri and heart disease, there were mucosal thickenings and moderate fusiform dilatations of the bile passages which were crowded with flukes and bright yellow inspissated bile. It is likely that the constant irritation of the moving parasites induced the hypertrophy of the ducts, while their mechanical obstruction to the bile-flow caused the dilatations. The liver substance adjacent to the dilated ducts was firm and showed many small hemorrhages presumably due to obstructed capillaries. I can not say whether the eosinophiles were increased in the blood, or noticeably present in the affected tissues as my specimens preserved for histological examination were disposed of during my absence.

DESCRIPTION OF THE CALIFORNIA PARASITE.

A flattened almost ovate-acuminate unsegmented reddish-brown, translucent, digenetic, liver fluke measuring from 18 to 22 m.m. in length, 3.5 m.m. in greatest breadth, and 1 m.m. in thickness, and being most conspicuously characterized by its translucency and the extensive hermaphroditic reproductive system which occupies, approximately, five-sixths of the body area, and which along with all the other viscera, is embedded, as it were, in firm granular-besprinkled parenchymatous tissue, there being no body cavity.

The parasite's body may be divided for description, into the broad anterior and posterior surfaces, the oral and excretory extremities, the two lateral borders and the three longitudinal areas—a median and two lateral which extend the length of the body and measure respectively 2.8 m.m. in breadth. The lateral areas appear as narrow strips on either side of the broad median area in which most of the organs are located. When placed on

a glass slide, the viscera may be clearly seen with the naked eye some more distinctly from the anterior surface, others more distinctly from the posterior surface. The most noticeable of the viscera from before backward in a longitudinal direction are: 1st, The uterus, which is confined to the middle two-fourths of the median area. It is a long brownish-red centrally located simple tube usually filled with eggs and lying between the intestinal ceca which separate it from the bilaterally and marginally placed compound racemose glands, the vitellaria, that appear as dark bars occupying the middle two-fourths of the lateral areas. 2nd, Two numerous and irregularly branching testicles situated posteriorly one in front of the other and occupying both the central and lateral areas. 3d, The receptaculum seminis, a white distended bottle-shaped or oval body about 1.2 m.m. in length. It is placed obliquely in the median area forward of the testicles and immediately aft the uterus. When the fluke rests upon its posterior surface with the oral extremity pointing away from the observer, the receptaculum seminis lies to the left of the middle line but to the right when the anterior surface is dependent, thus affording a ready landmark. The organs appearing most distinctly from the anterior surface of the body are, oral sucker, acetabulum, vitellaria, germarium and shell gland, right and left spermatic ducts, branches of testicles. From the posterior surface, vas deferens, receptaculum seminis, vitello-ducts, Laurer's canal, intestinal ceca, excretory canals and testicular nodes

The fluke's cuticle is very thin, smooth, free from cilia, spines, hooklets or other projections except on the anterior surface at the acetabulum where there may be seen when the parasite is floated in water on its side, a triangular projection perpendicular to the surface. At a corresponding point on the posterior surface is a slight bulging caused by the turning forward of the vas deferens, which may be seen with the naked eye as a white sinuous tube following the middle longitudinal line posterior to the uterus.

The oral extremity is almost entirely occupied by the oral sucker. The excretory extremity is pointed and contains the excretory pore. The right and left lateral borders are somewhat

rounded anteriorly along the area between the oral sucker and acetabulum but elsewhere they are sharp. The organs classified functionally are as follows:

THE ALIMENTARY SYSTEM.

This comprises the oral sucker, pharynx, esophagus, intestinal ceca, excretory canals and pore. *The Oral Sucker* is the

circular muscular organ about 2 m. m. in diameter that occupies the greater part of the anterior or oral extremity. It is directed upward and anteriorly. From it arises the *Pharynx*, a funnel-like cavity with oval-shaped muscular walls about 1.2 m. m. in length. From the pharynx arises the *Esophagus*, a short narrow tube about 1.6 m. m. in length. This divides posteriorly into the right and left *Intestinal Ceca*.

The Ceca are the simple tubes about 0.6 m. m. in diameter that extend bilaterally on either side of the median area from the esophagus anteriorly to near the posterior extremity where they end in blind pouches. Frequently their contents are very dark in color:

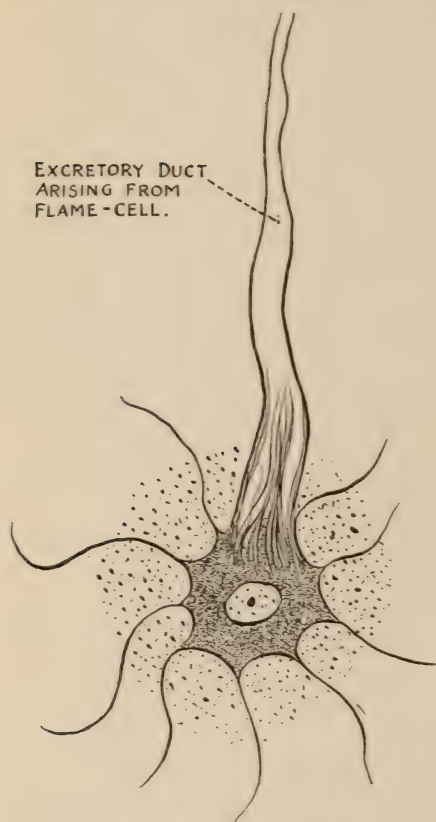


Fig. 2. Flame Cell.

The Excretory Canals throughout their winding course have extremely thin walls and it is very difficult to trace them. So far as I have observed, their approximately relative sizes, rela-

tions to one another and to the intestinal ceca, spermatic ducts and vitellaria are as indicated in Fig. 1. They originate from many flame-cells (Fig. 2) throughout the body, growing in size as they pass forward bilaterally between the ceca and vitellaria up to the acetabulum where they turn upon themselves, having received a small cephalic tributary, and proceed backward to empty into the posteriorly and centrally located curved tube (the colon?) that empties through the excretory pore. Only the colon is visible to the naked eye, the other tubes appearing in the illuminated fluke under the microscope.

PHYSIOLOGY OF THE ALIMENTARY SYSTEM.

Bile appears to constitute this parasite's food because its favorable habitat the bile passages do not offer a mucosa from which tissue fluids could be obtained readily as is done in the case of certain intestinal cestodes. The oral sucker appears to be poorly adapted for adhering and sucking or for stripping epithelium. Furthermore the contents of the ceca tend to indicate the food source and composition.

It is believed that food entering the ceca is appropriately altered so that the nutritive portion is absorbed therefrom for assimilation and that the flame-cells deliver the waste products of metabolism to the excretory canals. The undigested particles of food are rejected through the mouth. At least such is my surmise from the process observed.

THE REPRODUCTIVE SYSTEM.

This includes the uterus, germarium (ovary), shell-gland, receptaculum seminis, testicles and spermatic ducts, vas deferens, acetabulum, vitellaria and vitello-ducts.

The Uterus, a simple tube about 1 m.m. in diameter begins in the ootype a minute cavity where the oviduct, vitello-ducts and Laurer's canal come together and winding out through the shell-gland falls into closely packed irregular convolutions that are grouped into a brownish mass lying between the acetabulum anteriorly, the shell-gland posteriorly and intestinal ceca bilaterally. When approaching the acetabulum the uterus passes upward and posteriorly as indicated in Fig. 1, then descending

opens through the genital pore of the acetabulum which is a circular muscular organ not unlike the oral sucker but smaller and of softer construction.

The Testicles. Each presents a small oval node which is best seen from the anterior surface of the body. These nodes lie in the concavities of the colon. From the posterior portion of each node there arises from four to five irregularly branching pouches that spread out on the posterior surface of the body, or better in the posterior leaflet, the nodes being in the anterior leaflet. Two simple leaves with their broad surfaces in contact represent the relation. Loop of the uterus also may be seen passing from one leaflet to the other. But there is no body cavity the viscera being embedded in parenchymatous tissue.

From the node of the anterior testicle arises the right *spermatic duct*, the left duct arises from the other testicle. These ducts pass forward in the anterior leaflet to about midway the uterine area through which they pass posteriorly and unite to form the vas deferens.

The Vas appears in the posterior leaflet as a white sinuous tube occupying the median line of the uterine area posteriorly. It passes the acetabulum on the same side with the receptaculum seminis and then turning forward empties through the acetabulum near the uterine opening.

The Vitellaria. These compound racemose glands are placed marginally in the middle two-fourths of the lateral areas and for the most part in the anterior leaflet. Each measures about 6 m.m. in length. From them the right and left *vitello-ducts* arise and pass obliquely backward and inward in the posterior leaflet toward the germarium (ovary) and come together in the ootype along with the oviduct, Laurer's canal, uterus and the duct of the receptaculum seminis, as shown in Fig. 3.

They convey to the ootype the yolk which consists of small round greenish bodies.

The Germarium (Ovary) is usually trilobate but occasionally a small fourth lobe exists. It is ovoidal and about 1.0 m.m. in length. The single lobe points to the side opposite to that occupied by the receptaculum seminis. Immediately about the

ovary and the beginning of the uterus is the *shell-gland* a bunch-of-grapes-like body. It appears to be made up of stroma and large globular bodies of granular material. These bodies are about six times the size of those in the vitello-ducts and they are brown in color.

The *Receptaculum Seminis*, a female organ, is a white bottle-shaped or oval body lying obliquely and posterior to the germarium. It is composed of a muscular capsule and a central mass held together by stroma and containing round and oval bodies.

Laurer's Canal passes from the ootype in a posterior direction and on the side opposite to that occupied by the receptaculum. It opens through a very small pore on the back or posterior surface of the fluke. Frequently it may be seen with the naked eye as a small black somewhat curved line about 3 m.m. in length. Its contents, morphologically and tintorially are similar to the bodies of the shell-gland and vitello-ducts and in like respects dissimilar to the contents of the receptaculum seminis and vas deferens.

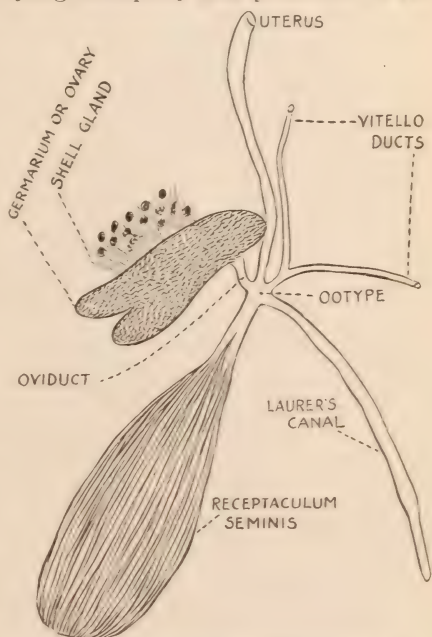


Fig. 3. Diagrammatic Illustration of the Ootype.

Functions of the Reproductive System. It is generally believed that the spermatozoa pass from the testicles in the right and left spermatic ducts which join to form the vas deferens that opens alongside the genital pore of the acetabulum; that the acetabulum a circular muscular organ like the oral sucker contracts and causes the spermatozoa escaping from the vas to enter

the uterus along the entire length of which they pass to reach the ootype where they unite with the ova, yolk and shell-gland substance.

The fertilized ova now become eggs in which cleavage advances as they pass along the uterus toward the acetabulum. It has been surmised that fertilization also occurs in the uterus.

The parasite is without a vagina or other organs of copulation.

I observed several flukes discharging eggs (Fig. 4). The acetabulum was dilated and a continuous string of eggs held together by a clear cement-like substance was

rapidly expelled for about fifteen seconds in a backward direction, and after an interim of five seconds the discharge was continued and likewise interrupted several times, the chain however not being broken but floating off in the warm saline solution. A bit of white material was expelled from the acetabulum immediately after the complete discharge of the egg-string. This morphologically and tinctorially resembled the contents of the vas deferens. The process together with the an-

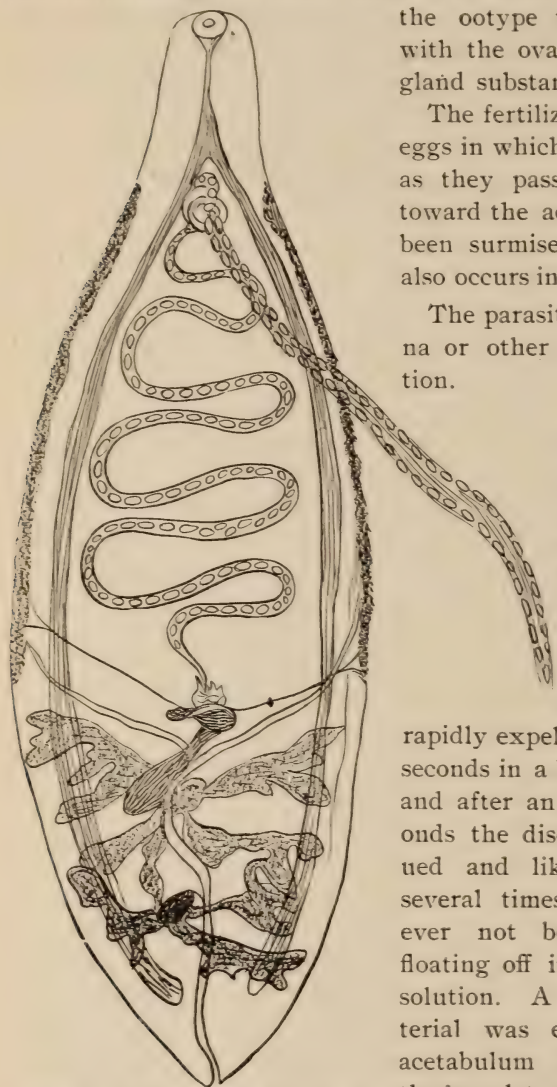


Fig. 4. Diagram showing the Discharge of the Egg String.

tents of the vas deferens. The process together with the an-

atomical arrangements of the parts rather suggested the possibility that fertilization of eggs might occur outside and not within the body—fertilization in a way comparable to that of certain oviparous fish. However, no micropyle has been observed and the eggs when discharged, apparently are fully developed, and the method of fertilization in similar species is pertinent.

I have unsuccessfully though carefully searched for evidence of miracidium in discharged eggs.

The Functions of Laurer's Canal are sub judice. Possibly it may subserve the purpose of a vagina, but its contents bring morphologically and technically similar to the vitellarial and shell gland granules, rather indicate a safety-valve action in connection with the ootype. I believe that sperm has been found in it and it has been regarded as a rudimentary part homologous to the vagina of ectoparasitic forms.

The Egg.—This is oval

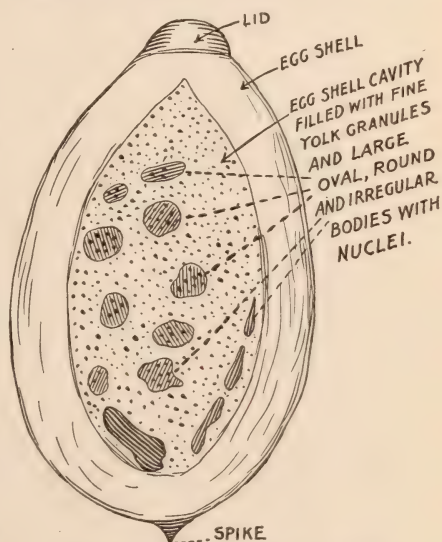


Fig. 5. *T. sinensis* Egg. Early Stage.

Toluidin blue stains the yolk granules pea green and the large bodies a distinct purple, their nuclei taking a deeper purple shade.

or hen's-egg shaped, and varies from .016 to .017 m.m. in breadth and from .028 to .03 m.m. in length. It presents at the smaller end a lid, and at the larger end a spike (Figs. 5 and 6). When stained with toluidin blue and differentiated by glycerin-ether, there may be seen from four to thirty bodies of a distinctly purple color, occupying the cavity of the egg. Those nearest the spiked end are irregular in form, larger than the others and do not show granules while those nearest the lidded extremity are circular and present eight to ten deep purple granules.

Among these circular bodies is one that is strikingly so, and also much larger and less intensely stained. On the right side of the egg-cavity are three oval bodies the anterior one containing several granules. When the egg-shell is broken the purple bodies promptly assume a distinct pea-green color.

The most anterior part of the egg-cavity is filled with small greenish granules—the yolk.

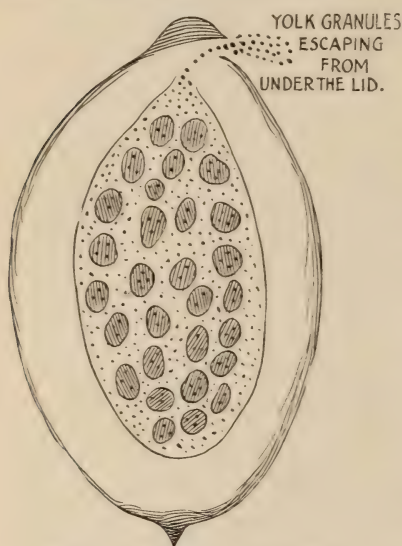


Fig. 6. The Egg. Later Stage.

The cavity of this later stage egg is filled with the large nucleated bodies which in some instances appear to force the unused yolk granules out of the egg cavity.

communicating on the dorsal and anterior body surfaces.

At the time of expulsion, ovulation, if it may be so termed, appears complete. I have never recognized any satisfactory evidence of miracidium yet its presence in the eggs ready to be discharged, has been reported or surmised. It is probable that much time elapses after the expulsion of eggs before the embryo takes definite shape.

THE CENTRAL NERVOUS SYSTEM.

This appears along the posterior surface of the lower esophagus and pharynx in the form of ganglia from which nerves encircle the esophagus and others pass backward

THE MUSCULAR SYSTEM.

The anterior one-half of the body contains numerous muscle-fibers arranged longitudinally, horizontally and obliquely. The viscera and suckers also are rich in similarly arranged fibers.

THE INTERVISCERAL SUBSTANCE.

This appears as a translucent light yellowish brown substance containing numerous black, brown and greenish granules. There is no body cavity. Along the area covered by the pos-

terior one-third of the vitellaria and the space between the vitellaria and transverse line of the posterior branches of the hind testicle, there appear, bilaterally, *parallel columns of brownish granules* which seem to extend from the ceca to the lateral borders of the fluke's body. I do not know what they are.

LIFE HISTORY OF THE FLUKE.

The *miricidium* is said to have been observed, but further, the life history and mode of transmission awaits demonstration, although it is usually believed to be similar to that of the fasciola hepatica in which the miricidium after escaping from the discharged egg swims about in the water until an appropriate pond-snail offers opportunity for it to penetrate some soft part and eventually find its way to the snail's liver where it becomes encysted and organized into the *third stage—the sporocyst*, which gives rise to the *fourth stage or redia*. The *Cercaria* developing from the redia leave the snail's body and reach the water where they become encapsulated on aquatic plants to await ingestion by the animal host in whose stomach the capsule becomes dissolved and the larval distome finds its way to the biliary passages when it develops and assumes the attributes of the *mature fluke*.

Reviewing my observations in the California cases, I am inclined to believe that some of the Chinese became infested in this country, but whether from imported or domestic food-stuffs, I can not say. In my examinations of imported Chinese aquatic foods, no encysted *Cercaria* were found, but the sand in which they were packed, contained shells of the undermentioned four genera of fresh water pond snails, to wit: Paludetrina, Melania, Aucylus and Limnea, together with the shell of a probable salt-water form of the genus Modiolus.

The demonstration of this Distomiasis in a goodly number of residents of the United States, urges due consideration of the following.

1st. This disease in the Orient is a wide-spread and rather serious affection.

2d. Asiatic gardeners are wont to fertilize vegetables by spraying them with aqueous solutions of human feces.

3d. Many vegetable gardeners in the United States are Asiatics, and the climatic conditions are favorable for the parasites' development. We do not know what mollusk or other soft water animal acts as the intermediate host of *Sinensis*, or indeed whether such a host is essential to the fluke's development. Neither do we know what pond-snail of this country is the intermediate host for *Fasciola Hepatica* which is well established in many sections.

4th. The implantation of this fluke in the United States is a distinct menace to the public health. In the province of Okayama, Japan, 220 fatal cases were recorded in twelve years; and it has been estimated that the mortality of the disease is fourteen per cent, the morbidity in some provinces being from fifty-five to sixty-seven per cent. [Katsurada.]

DIAGNOSIS AND TREATMENT.

The *presumptive diagnosis* may be governed by symptomatology, the *positive* by microscopical examination of the feces for eggs and shreds of flukes.

Prophylactic Treatment. Sanitary supervision of vegetable farms, by the state, with the view of preventing the use of feces both human and animal, or of lake, pond or other probably contaminated waters or places in the cultivation and care of vegetables. And if practicable, to prevent the importation of presumably infected foods. The presumption of course being that this fluke's life history and the mode of transmission are similar to that of *Fasciola Hepatica*.

MEDICINAL TREATMENT.

The flukes appear to do harm: 1st, by eating the bile so that its physiological action is prevented; 2d, by mechanical obstruction to the bile flow with resultant dilatations of the bile ducts and consequent pressure on the liver cells and circulation, thereby interfering with the several hepatic functions and causing jaundice and numerous capillary hemorrhages into the parenchyma, and eventually ascites; 3d, by the production of secretions and excretions harmful to the system or to digestion. Medicines have proven unserviceable. As already noted, plague infection proved

to be an energetic parasiticide, while neither death from a non-infectious heart lesion nor from beri-beri appeared, injuriously to affect the fluke. It may therefore be possible to conjecture that in the process of Haßkinization, a parasitocidal amount of plague toxins or of induced tissue products, might be excreted in the bile, the flow of which probably would be sufficient to flush the ducts of the dead flukes.

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For zoological information and references I am indebted to the Hygienic Laboratory, Division of Zoology, Dr. Charles Wardell Stiles; and to Dr. Dall of the U. S. Geological Survey and Smithsonian Institute.

CHROME LEATHER FOR SOLDIERS' BOOTS.

CHROME leather, manufactured by the Madras School of Art, is recommended by Lieutenant Colonel R. Kirkpatrick (*Journal of the Royal Army Medical Corps*) for soldiers' boots as being more pliable than ordinary leather and retaining its pliability longer because of its almost water proof character. It is more durable than ordinary leather and about one-third lighter, while its cost is probably, if anything, a trifle less. In wet weather it does not become sodden, dries rapidly and does not become stiff, all material advantages for military service.

THE OREGON NATIONAL GUARD AT THE SAN FRANCISCO EARTHQUAKE DISASTER.

BY CAPTAIN WILLIAM E. CARLL.

ASSISTANT SURGEON IN THE OREGON NATIONAL GUARD.

ON April 19, 1906, I was detailed by Adjutant General W. E. Finzer of the Oregon National Guard to proceed to San Francisco and report to Governor Pardee of California tendering to him the Hospital Corps of the Oregon National Guard for volunteer service to the people of California who suffered from the earthquake and fire which destroyed the city of San Francisco on April 18, 19, and 20.

The Corps arrived one day later, and consisted of four Surgeons, ten enlisted men, together with a complete Regimental Field Hospital equipment, of drugs, surgical dressings, instruments and bedding, etc.

After two days camp at the Presidio we were detailed to report to the Health Commission of San Francisco for duty and were immediately assigned to establish an emergency hospital in what is known as the Potrero district of that city. The Wilmerding Industrial School was given us in which to inaugurate a hospital.

The conditions at this time were very chaotic, there were over two hundred thousand people living in tents short of food and clothing and still suffering from the shock of the disaster, many of them sick, and discouraged.

It was necessary to work hard and quickly; the only advantage we had was in having a building with good water supply, fortunately the water in this district was quickly reestablished; there was no light except from candles; the chimneys were all down and no fires allowed in any building; it was necessary to obtain cooking range, cooks, dish washers, waiters, food fit for sick babies, injured men, women and children, set up cots, enlist nurses and admit patients all at once.

In less than twenty hours after arriving at this place we had nearly fifty bed patients, were treating dispensary patients at the rate of about one hundred a day, had food sufficient for immediate needs, all the help necessary to run the kitchen department, four surgeons of the corps, and one volunteer surgeon assisting in the out-patient department, together with ten volunteer nurses. The services of these nurses were most valuable; two of the number came from Portland, Oregon, under volunteer service, four were nurses who had been rendered homeless by the fire in San Francisco, and four were volunteer nurses from Seattle, Washington; they worked early and late, there could be only one rule,—everybody work all the time if necessary, and for several days it was necessary.

The number of patients increased until we had fifty bed patients and were treating one hundred in the out-patient department, the number was about equally divided between medical and surgical cases.

Contagious and infectious cases and demented cases were examined but not received by us but sent to the places designated by the Health Commission to receive them.

Rheumatism and pneumonia prevailed in the sick wards. There was much enterogastritis resulting from the food stuffs the people were obliged to consume; it was quite evident from the large number of such cases as well as evident from examination of the canned food that many of the supplies which had been donated had come from old stock, and as it was impossible to inspect it all, much sickness was caused by its use; one death took place in our emergency hospital caused by ptomaine poisoning although it was not possible to make an autopsy at that place.

In the surgical wards the accident cases consisted of fractures; there were three cases of Potts fracture, three Colles, one of the elbow and one of the acromion; the balance of the surgical cases were of a minor nature. Quite a number were cases from hospitals which had been destroyed and the patients scattered until they could find some other place to be cared for. In the baby ward we had six sick babies all suffering from gastric disturbances and five of them with pneumonia with one death.

One child a girl ten years old died from injuries received in falling from a small foot bridge; the injuries were internal; no autopsy, but appearances indicated hemorrhage of liver from rupture.

During the ten days we conducted the emergency hospital we treated in the wards of the hospital fifty-five medical and thirty surgical cases, in the dispensary 495 medical and 305 surgical cases. In addition to this we fed about one hundred refugees every day and furnished many with blankets and articles of clothing.

At the end of ten days the various hospitals and other institutions of the city were in shape to take the patients and they were all transferred to the homes of friends or to some other hospital, and the Corps returned to Portland, Oregon.

There was much to learn while on a duty of this sort—how to feed, care for and properly treat this number of patients under the most adverse circumstances. Such food as could be supplied for well people was not practicable or useful for a hospital, and after one day had been provided for it was necessary to look out for the next one; it was imperative that milk, eggs, fresh meat and fresh vegetables should be on hand, and the methods sometimes resorted to had best be left to the imagination of the reader of this article; it is enough to say that we were never without such foodstuffs as the patients required, and we had them in reasonable abundance.

The supply of medicines in the city was very short, surgical dressings and materials were also short and it should be a lesson to the national government to keep a supply of these materials at available points for emergency use; these materials are easily stored, do not deteriorate for a long time and could be stored for use to good advantage.

There was much fault found with the Red Cross Society for the way they did things or rather the way they did not do things which they might have done; my criticism is that there were too many officers riding about in automobiles making much noise and fuss, promising all sorts of relief for everybody and so far as my observation went failing to execute these promises. This condi-

tion was much improved after Dr. Devine took charge and at present this Society is doing good work and lots of it; the only trouble was in the first week or ten days when the Society was sadly in need of somebody who could do things or at least direct others to do things. It was of little use to destitute children and people who needed clothing to have some Red Cross official toot up in an auto and promise immediate relief and never see the party again; the next day another would come along and make careful note of what was needed, and so on every day some official; but in the twelve days I was on duty not one promise made good.

The officers of our Hospital Corps consisted of Major Sternberg, Captain Carll, Captain Wight and Lieutenant Marcellus, with Dr. Berkley as a civilian volunteer. Major Sternberg was called home on account of his father's death, when the command devolved upon Captain Carll.

THE ELIMINATION OF MOSQUITOES.

THE habits of the mosquito are described so far as they are known by A. H. Doty, New York, (*Journal A. M. A.*) with special reference to the extermination of the insect. The first important fact is that mosquitoes propagate only in water, and the commonest form, the culex, has a special preference for contaminated or foul waters. There is a salt-water mosquito which abounds on the Atlantic coast and breeds in the salt marshes, hibernating in the mud when they are not overflowed. The common impression that the mosquito is a short-lived insect is not altogether correct, and Doty thinks that a large proportion of the earlier mosquitoes of the season are the eggs and insects that have hibernated during the winter. They can live for many weeks during the warm weather, and have been kept for weeks in captivity. The anopheles or malaria-bearing mosquito differs from culex in not preferring contaminated waters, but breeds rather in surface water with green scum. It may be found together with the culex in offensive water, but this is rare. As a rule, mosquitoes do not go far from home, though they may be carried by the winds or public conveyances.

WHEELED KITCHENS FOR TROOPS IN THE FIELD.

BY COLONEL HENRI MARESCHAL,

PRINCIPAL MEDICAL OFFICER OF THE FIRST CLASS IN THE
FRENCH ARMY.

TRANSLATED BY LIEUTENANT ROBERT M. THORNBURGH,
ASSISTANT SURGEON IN THE UNITED STATES ARMY.

WHEN, on the evening of a battle or after a long march, the weary soldier arrives at the halting place, he will, in that conditon, voluntarily eat only when he finds his food all prepared *immediately*. Otherwise he prefers to lie down and sleep. Sometimes he will hastily prepare some food that he will eat raw or half-cooked or rather he will drink alcohol.

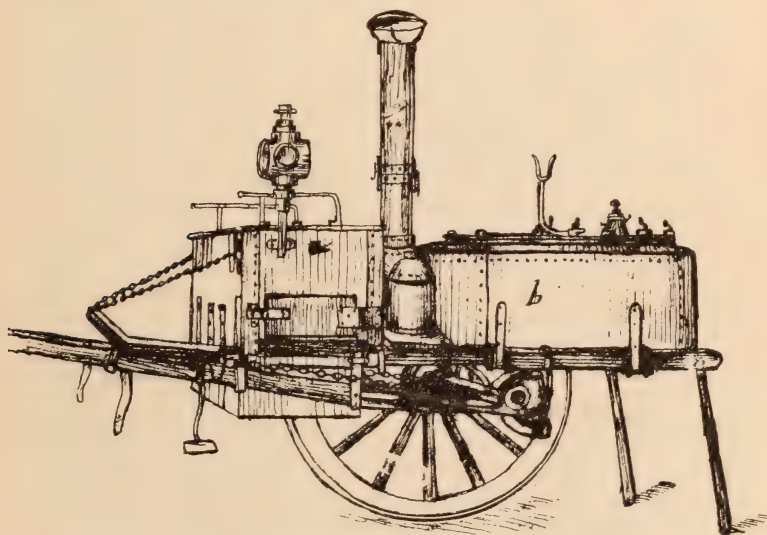
It is from this practice that we are exposed to increased sickness, diminution of effectives and demoralization of troops.

Napoleon said that battles are won with the soldier's legs, and Frederick the Great, that the vitality of a soldier is a question of the stomach. We can be certain that the regular and rapid distribution of hot food to the troops will ever have the effect of diminishing the number of stragglers and increasing the moral and physical vigor of the soldier.

Is it not surprising that this apparently simple question has remained so long in the realm of theory? However, it seems for several years past to wish to leave the theoretical stage and enter that of useful realization.

Since 1897 Russia has made a study of numerous models and quite recently in Manchuria, where such favorable results were obtained that they impressed other countries. France has opened a competitive test of "Wheeled Kitchens" and they were actually experimented with at the Grand Maneuvers, September 1905. Germany and Italy also are occupied with this question, with the firm intention of settling it.

There are a number of different models but we are personally acquainted with two only: those of Colonel Debronrawoff and Colonel Braün. These are the ones that we wish briefly to describe nevertheless, there is no desire on our part to compare the different systems and select the best—that is the business of the Competition Board—but we can utilize the experience already had, in trying to determine what qualities in a wheeled-kitchen are required by the military chiefs and ascertain whether they fulfill the conditions imposed upon them.



Wheeled Kitchen—Braün Type.
a. Chest for Utensils. b. Boiler.

These two types are built for 240 men (four wheels and two horses) and for 120 men (two wheels and one horse) respectively. We illustrate the latter, since we prefer it on account of its lightness.

I. Debronrawoff Type (Salkind Patent).—Before this was employed in Manchuria, it was tested by a commission, primarily as to strength of construction, rather than for its efficiency in preparing several kinds of food simultaneously.

Its strength is proven in the following way: The kitchen

itself can be easily lifted by three or four men and placed on any vehicle whatever; it has been so done in a number of instances, sometimes on a unit of the wagon train and again on the simple peasant wagon, with wooden axles. During the Russian maneuvers they traveled without deterioration 400 kilometers, over various roads, in this fashion.

The second requisite quality has given equal satisfaction to the Commission. While cooking soup and meat, water can be heated for tea or coffee. This kitchen is composed of a boiler, a large copper kettle, an oven and two stew pans. The boiler is for soup, the kettle for tea or coffee, the stew-pans for meat, and the oven for roasts; even bread can be baked in it. An infantry march allows the kitchen to use its fire-box and thus cook food without necessitating a halt.

From the report of Colonel Schupinsky, commanding the 119th Infantry, about three hours are required to prepare a complete meal for 120 men. If, instead of baking bread between meals, boiling water is desired, eighteen bucketfuls can be obtained in an hour and forty minutes, as the kitchen can keep up an uninterrupted heat for twenty hours without inconvenience.

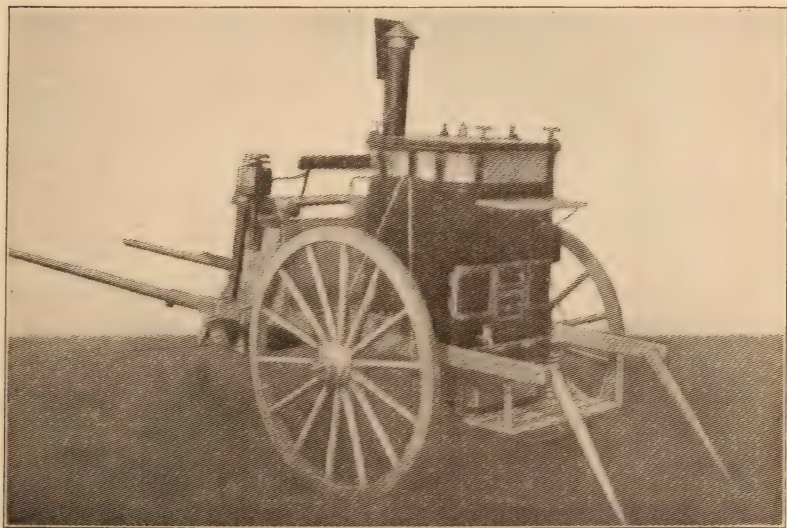
All the utensils may be cleaned, dismantled and repaired easily. They possess no flimsy mechanism that breaks readily, and a defect in one part does not prevent the operation of the remainder. A box placed in front carries all the kitchen utensils.

Such is the information furnished by the report of the Commission. General Schetshagin, commanding the 30th Division of Infantry, verified the decidedly satisfactory results obtained from his experiments. General Lawroff and Colonel Folbäim experimented in the same way. General Massloff, commanding the 4th Army Corps, recommended the adoption of this kitchen by the entire Russian Army.

II. *Braün* Type.—This wheeled kitchen has also been used by the Russians in Manchuria. We are unable to say whether this has been judged superior or inferior to the preceding, for we are unfamiliar with the report thereon, but in a measure we may give the results obtained from recent experience in France, at the special annual exercises of the hospital corps (*Service de*

Santé,) in July, 1905, under the direction of Colonel-Surgeon Nimier.

Two kitchens have been tried experimentally—one for 140 rations, two wheels and one horse; the other for 200 rations, four wheels and two horses. Each is composed of two parts—the boiler and its fire box and a box placed in front. The boiler is inseparable from its fire box, like an autoclave. It can, when at station, be removed from its vehicle and function in the same manner as in barracks.



One Horse Wheeled Kitchen for 120 Men.

The box contains various compartments, one of which is lined with zinc and specially arranged to receive the meat, cooked boneless, when it has been withdrawn from the boiler after three hours of cooking.

At five a.m., July 25, 1905, the kettle was filled with water and the fire lighted and on leaving Paris forty-five minutes later, the liquid began to boil. The fire was kept up until the arrival at Versailles at nine a. m., a distance of seventeen kilometers. The consumption of wood during this time was about ten kilograms

per hour per kitchen. The water was still tepid at six p.m. but it is true that the exterior heat was very great.

On July 26 the fire was lighted at six a.m., one hour before departure. The four-wheelers contained water only, for tea-making. The two-wheelers received twenty-five kilograms of meat and vegetables. At nine o'clock the bouillon was already good to eat, at 10.30, though the fire had been extinguished for an hour, the bouillon was very hot. It was distributed alike to the hospital corps men, sham wounded and to a great number of officers and surgeons who were following the special maneuvers. They unanimously declared it excellent. A distance of five kilometers had been covered, partly on bad roads.

On July 27 the two-wheeler left with the ambulance, to furnish prepared food en route in the same manner as before. The four-wheeler was used to feed the hospital corps men and sick at the field hospital. In order to reach its destination it had to traverse many fields and stony roads at a rapid pace.

On July 28, the last day of the exercises, the field hospital lighted the large kitchen at the moment of departure—five a.m.—and served an excellent meal to the hospital corps on arrival at eight a.m. The small kitchen was lighted en route and prepared tea for the sham sick and wounded. At the end of the exercises it was shown that no deterioration had been sustained, although inexperienced men had been employed.

Thus, very great advantages are presented but there are other desiderata of which the principal are the following:

They are not provided with a foot-board on the rear, rendering it necessary to stop the horses for the cook to alight and look after his fire, hence it is necessary to place them at the rear of the column to avoid the sudden stops during the march. This is not wholly unfavorable, since the men avoid the discomfort caused by the smoke, but it puts the kitchen a long distance away from the unit to which it pertains—if that unit be a regiment.

It cannot furnish a reserve of hot water; the quantity of fuel carried in each wagon is insufficient; absence of a brake is dangerous when travelling on a road at a rapid pace.

Let us hope that these desiderata will appear in the future and, we may add, in the competition just opened in France, for "Military Wheeled Kitchens," the principal object assigned to the constructor is to obtain a daily supply of 300 liters of bouillon and sixty liters of coffee, by means of a separate container that will work simultaneously. Each wagon is intended for a company of infantry; it should be sufficiently strong to follow every column and its weight should not exceed 1,500 kilograms, including utensils.

Before closing, it appears interesting to us to recall that independently of the wheeled kitchen, the imagination of inventors has been busy trying to heat water by means of lime (calcium oxid) and various other substances. This process would seem to be especially useful in isolated small camps.

In France, Sub-Intendant Aubry, stationed at Havre, has recently sanctioned the employment of an apparatus, which, according to his report, obtains with neither wood nor coal but by the aid of a chemical process not yet divulged, the following results:

I. In five minutes a half liter of coffee, tea, etc., or the warm up of canned meat.

II. In a quarter of an hour, cooking a soup containing meat, potatoes and other vegetables.

III. In two and a half minutes, sterilized water.

IV. In twelve to thirteen minutes, a soup prepared from pea flour, string beans and minced slices of meat.

If, when submitted to a commission, actual experience with this process should be crowned with success, it would have the following advantages:

It would be possible to avoid the employment of ordinary combustibles in regions where they cannot be found.

In case of war, the position of the troops would not be signalled to the enemy, since there would be no escape of smoke.

The troops would eat hot food without any loss of time.

The medical service could rapidly obtain, not only hot drinks but also sterilized water to render aseptic the instruments and dressings.

Finally, these results could be obtained under all circumstances, in spite of rain, wind, etc.

All these researches and experiments that we have only briefly related, are certainly of great interest, since the object in view is to ameliorate the condition of the soldier's existence, at the same time becoming an aid to strategy; therefore it appears to us to merit repetition and encouragement.

We will make this remark, especially, while admitting (it is not demonstrated) that they present more disadvantages than advantages, (increasing length of column, very voluminous smoke, difficulty of repair, etc.) for large bodies of troops, we think their use will be particularly valuable, not only for the sick and wounded but also for the surgeons and hospital corps men, with whom tiresome work continues on the evening of battle, after they have already marched and worked all day.

THE MODE OF INFECTION IN MALTA FEVER.

WITHIN a short time several articles have appeared in English medical journals on Malta fever. Dr. E. H. Ross, in *The Journal of Tropical Medicine*, and an editorial in the *Journal of the Royal Army Medical Corps* summarize the progress made in the direction of finding out the occurrence of the specific coccus, the way it leaves the animal body, and the mode of infection. Malta fever is endemic not only in the island of Malta, but also in Egypt, in the Philippines, in Hong Kong and in India. The British army and navy in the Mediterranean are both heavily afflicted, and in Malta, where the milk supply is mostly from goats, about fifty per cent of these animals are afflicted with *m. militensis*, and ten per cent have the coccus in their milk. The cows, as well as other animals of the island are also infected. The *m. militensis* has been found in the blood, in the blood-making organs, in the urine, and in the milk. Of these, the last two are the most important, unless, as Ross believes, some blood sucking insect is the method of infection.—CHARLES S. BUTLER.

TUBERCULOSIS IN THE MILITARY SERVICE.

BY MAJOR GEORGE E. BUSHNELL,
SURGEON IN THE UNITED STATES ARMY.

IF the question be asked why tuberculosis is present in the Army of the United States, two answers immediately suggest themselves. First that the recruit has tuberculosis when he enlists; second that the disease is incurred by infection during the term of service. It is evident that in seeking to diminish the prevalence of the disease in the ranks our course must be decided by the relative importance which is to be assigned to these two modes of introduction. In an Army like ours, in which the dietary is ample, the clothing good, the barracks in at least fairly good sanitary condition, and in which the soldier's life in peace is not characterized by undue exertion, the presumption would seem to be that tuberculosis would not readily develop in a soldier who enlists in perfect health and with this presumption in mind we should turn our attention with especial care to the examination of the recruit. Much of the tuberculosis in the Army is ascribed by the Surgeon General in a recent report to defective examinations of recruits by civilian physicians. The qualifications of such examiners can not be fully known and the fee paid for examinations is not sufficient to lead any but the most conscientious and painstaking to devote enough time to determine the presence or absence of early or limited tuberculosis. A great improvement has no doubt been made by the recent regulation which requires the examination of recruits to be performed by medical officers of the Army. But let us not flatter ourselves that the evil will be entirely remedied by this regulation! It can hardly be expected that all medical officers will possess the expert knowledge requisite for the determination of early tuberculosis, such determination being made the more difficult by the fact that the man examined instead of aiding by a correct statement of facts as in civil

practice will be likely to conceal such facts as would tend to bar his enlistment. The diagnosis of incipient tuberculosis, one of the most difficult problems of internal medicine is properly the duty of a specialist. It would seem advisable to station an expert at the larger recruiting depots whose task it should be to devote particular attention to lungs of the recruit with a view to the rejection of tuberculous cases at so early a stage in their Army career as to preclude the possibility of the claim that their disease could have been incurred in the military service. But granting the possibility of the exclusion of tuberculosis when sufficiently advanced to be capable of diagnosis and the extreme desirability of our best efforts to attain that end as perfectly as possible, many recruits will present themselves who have tuberculosis in so early a stage that the diagnosis is not possible. Cornet estimates this "unavoidable percentage" for the German Army at 0.42 per cent of recruits which is not far from our average admission rate for tuberculosis for the Army (4.26 per 1,000 in 1904). Some of these early cases are doubtless cured by the improved sanitation of their army life, others will go on to develop the disease after a service of a year or two, and their disability will be considered as incident to their army service. Supposing that the new recruit already the victim of incipient tuberculosis has been accepted and entered upon his army career, what is the likelihood that his disease will be speedily detected? To answer this question it may be well to turn aside for a moment to examine some of the recent statistics of Fort Bayard.

During the first seven months of the year 1906, fifty-four deaths occurred at the United States Army General Hospital of which thirty-two were of soldiers. Of these, three patients died of non-tuberculous disease. Of the remaining twenty-nine cases, in twenty-five pulmonary tuberculosis was the only or chief cause of death. Six of the twenty-five cases are excluded on account of the long stay of the patients at this hospital (eight months to two years) and one on account of the acute nature, leaving eighteen cases in which the period of treatment at this hospital was so brief that changes in the lungs so far as they were of a chronic nature may fairly be said to have existed prior to

admission. These cases are divided into two classes: Class 1, cases of short service in which autopsy showed long standing disease. The average length of service in these cases was eighteen months, the duration of treatment at this hospital varied from five months and twenty-eight days to nine days, average was two months and twenty-four days. But one of these cases was reported as not in line of duty, the disease having existed prior to enlistment. In this case it was evident that the disease must have been in a state of activity when the patient was enlisted. That the other cases were cases of long standing was shown by the massive fibrous induration of the lungs found at autopsy. One case was first detected by the supervention of tuberculosis of the pharynx, always a late complication. Class 2, cases of relatively long service in which the disease was not detected (or was not properly treated) until shortly before death. There are eleven cases in this class. The patients had served from periods ranging from eight years to three years and two months, the average being five years, nine months. The duration of their stay at this hospital averaged two months and twenty days, the shortest stay being twelve days, the longest four months and twenty-three days.

As a rule the history given by patients is quite unsatisfactory as respects the first evidences of tuberculosis and these cases are no exception to the rule. It is noted however in one case of over seven years service that pleuritic pains were present in 1898. This patient was admitted to sick report March 11th, came to this hospital April 12th, and died July 28th. Another patient noticed that he began to lose weight in 1900. As far as can be ascertained he was not admitted to sick report for tuberculosis until two weeks before February 16th the date of his admission to this hospital. He died on May 31st. In another case the patient had an attack of hemoptysis in July 1905 which he ascribed to the altitude of Fort D. A. Russell and apparently did not report. He was admitted to this hospital February 15th and died April 26th. Massive development of fibrous tissue in the lungs showed that in all these cases the disease had pursued an extremely chronic course. The statements as to the chronic features of these cases

are not of course intended to exclude the extensive miliary involvement of previously healthy lung tissue which usually characterizes the terminal stage nor to imply necessarily the absence of caseous areas, etc. The point upon which stress is laid is that even in cases of acute course at this hospital, there is almost always evidence at the autopsy that the disease is of long standing. Eighty-nine soldiers were discharged for pulmonary tuberculosis at Fort Bayard upon surgeon's certificate of disability in the period from January 1st to August 31st, 1906. Their length of service in the enlistment in which they were discharged was as follows:—

TABLE I.

	1st Enlistment	Reenlistment	Total.
Less than 1 year.....	3	10*	13
1 to 2 years.....	11	34†	45
2 years and over.....	16	15	31
	<u>30</u>	<u>59</u>	<u>89</u>

TABLE II.

The total length of service of soldiers who had enlisted more than once was:—

3 to 4 years.....	4
4 to 5 years.....	18
5 to 6 years.....	15
6 to 7 years.....	10
7 years and over.....	12
	<u>59</u>

Of these 59 cases, in 26 the service was continuous.

The average stay of soldiers at this hospital before discharge for disability is six months. Referring to Table I the eleven cases reported as having served between one and two years in the first enlistment had an average service of one year, six months and nine days. The thirty-four reenlisted cases of between one and two years service had an average service of one year, five months and seven days. Now if from these averages six months be deducted as the average stay, it is manifestly correct to say

*Includes one patient reenlisted at this hospital.

†Includes two patients reenlisted at this hospital.

that of the soldiers discharged for tuberculosis at this hospital in the period from January 1st to August 31st, 1906, much more than one half had been examined for enlistment or reenlistment and passed as sound about one year before their admission to this hospital as tuberculous patients.

The chronicity of the pulmonary lesions as almost invariably shown at autopsy even in cases of brief stay at Fort Bayard, requires us to assume *a fortiori* a chronic course previous to arrival for the numerous cases in which the extent of involvement is relatively large but which do not terminate fatally. The assumption that tuberculosis is first incurred in the enlistment in which the soldier is serving when the disease is detected is therefore only probable for the comparatively small percentage of truly incipient cases.

The bearing of this conclusion upon the subject of the enlistment or reenlistment of the tuberculous needs no further comment. As for the detection of tuberculosis in the soldier on duty, it should be said that in the opinion of the writer the medical officer is not always or indeed often to blame under present conditions for failing to discover the disease at the earliest moment. It must be remembered that as our army is conducted, soldiers are expected to present themselves for treatment. Often the tuberculous soldier has no idea that he has the disease or he suspects it and dreading to know the truth he keeps away from medical observation as long as possible. In one recent case the disease was discovered while the patient was under treatment for a street car accident. In another the patient was enlisted in November and had a severe attack of hemoptysis in December which he did not report. He consulted his medical officer for the first time in January for diarrhoea and advanced pulmonary tuberculosis was detected. In the experience of the writer a case of tuberculosis among soldiers is often first discovered when a captain noticing that one of his men has a chronic cough sends him to the medical officer for examination. In justice it should be added that while the number of cases in which the diagnosis is made too late is undesirably large, in many the disease is found at a very early stage and its treatment is all that could be desired.

In a circular from the Surgeon General's Office dated February 24, 1902, the Surgeon General calls attention to the danger of infection of barracks by the sputa of individuals suffering from tuberculosis and enjoins upon medical officers to see that all apartments which have been occupied by cases of tuberculosis are thoroughly disinfected. But should we not go a step farther? In view of the length of service of many tuberculous cases as shown above it is not too much to say that there are hundreds of tuberculous soldiers serving in the army today as yet undetected and that it is highly probable that *every barrack in the Army* is more or less infected with tuberculosis. It is therefore to be desired that thorough and frequent disinfection of barracks and guard houses as well as hospitals be made a matter of routine sanitation, whether tuberculous cases are known to have been present or not.

The diagnosis of tuberculosis being made, the question of the disposition of the patient next arises. According to Army Regulations the proper course to pursue is to send him at once to the General Hospital at Fort Bayard. The assumption upon which this regulation is based is of course that the disease has been detected in its incipency. The patient is therefore presumably able to travel and is sent away for his own good as well as for the purpose of removing a source of infection. Too often however as has been shown, the disease is far advanced when discovered. Tuberculosis is generally a chronic disease with exacerbations which are due to the breaking down of tubercle and which are attended with fever, profuse expectoration, etc. The existence of the chronic type of the disease is generally discovered during an exacerbation. This is a critical time for the patient and upon the treatment which he receives depends largely his future. If fever is persistently high, it can not be too emphatically affirmed that he should be put to bed and kept there until the fever abates or until he dies. The really dangerous time for others has been that during which the patient was on duty. The disease being now known to exist there should be no danger of spreading infection if the precautions of any well regulated hospital are observed. No climate, no skill, can compen-

sate for the injury done the patient by exposing him to the fatigues of a long railroad journey at a time when he needs absolute rest above all things. The excuse for the writer in thus affirming what may be regarded as obvious therapeutic facts is much experience which has shown but too well that many patients lose what chance of recovery they may have had by an over close compliance on the part of the medical officer with the supposed requirements of Army Regulations.

The General Hospital at Fort Bayard, N. M. was originally established as a hospital for the segregation of tuberculous cases arising among the beneficiaries of the Soldiers' Home at Washington, D. C. The advantages which might be derived from such an institution in the treatment of tuberculous soldiers was however speedily perceived and the scope of the work was widened accordingly. Since December 28, 1902, patients from the Navy and Marine Corps have been admitted.

The institution subserves three ends. First, segregation of the tuberculous; second, care of far advanced cases; third, cure or arrest of the disease in incipient and moderately advanced cases. So far as concerns the original purpose for which the hospital was established, that of separating the tuberculous from the non-tuberculous inmates of the Soldiers' Home, segregation is completely successful. Tuberculous beneficiaries are not allowed to return to the Soldiers' Home until their disease is arrested. As respects the protection of the community however, less benefit is conferred for the reason that it is not practicable to retain at Fort Bayard beneficiaries who are able to travel. Such cases go and come at will the only limitation upon their freedom being the regulation that when discharged from the Hospital they are obliged to remain away at least three months. Segregation of the tuberculous for the benefit of the community as a whole in view of the long duration of the disease and its comparatively slight infectiveness, is a feature that is not likely to be generally accepted. It is feared however that in some cases the haste in which the tuberculous patient is sent to Fort Bayard irrespective of the fact that he is acutely ill and quite unfit for a

railroad journey, is dictated by a fear of infection and a desire to be rid of the bearer of it at any cost.

No case is ever refused admission to the Hospital at Fort Bayard on account of its severity. This beneficent provision saves the consumptive much suffering during his final illness and it benefits the community no doubt by limiting infection. At the same time it renders impossible a comparison of the results of the Army sanatorium with those of civil institutions in which the cases are selected. The following table giving the time of death of cases under continuous treatment, the large majority of which are soldiers, shows how large a proportion of the deaths occur in patients who are admitted in a practically hopeless condition.

	Cases	Weeks				Months		Years	
		1	2	3	4	2 to 6	7 to 12	2	3
1901.....	40	4	5	1	6	18	6	2	1
1905.....	47	1	6	1	3	22	9	4	1
		5	8	2	9	40	15	6	2

From this table it appears that 27.5 per cent of deaths in this class of cases occurs within one month and 73.6 per cent within six months.

The Fort Bayard hospital is only properly speaking a sanatorium in as far as it deals with cases of slight or only moderately advanced tuberculosis in which there is a reasonable prospect of arresting the disease. The majority of the patients whose disease is not so far advanced on admission as to lead to death within the year have their life prolonged indefinitely. Comparatively few however are returned to duty as soldiers. Twenty cases have been returned to duty since January 1, 1905, a number which constitutes a small percentage of cases under treatment. It may then well be asked whether the hospital justifies its existence as a purely military institution. Manifestly if success is measured by the return of men to active service it does not. If it be considered that the present term of enlistment is but three years, that the disease has generally been present for at least several months before detection, that the duration of the sanatorium

treatment should be at least six months, in the mildest cases, it is readily seen that but a small fraction of the enlistment remains during which the cured patient can serve after return to duty. A practical difficulty which might not be foreseen is that the enlisted man sent to duty as cured is an object of suspicion owing to the exaggerated bacteriophobia for the inculcation of which in the laity the medical profession is responsible. The average company commander does not desire the return of soldiers who are known to have had tuberculosis, and the first cold or other illness is often taken advantage of to secure discharge for disability. The Navy Department is understood to hold that the conditions of life upon the modern battleship are such as to render it undesirable that sailors who have had tuberculosis should be returned to service. In view of the demands now made upon our Army as to tropical service, such a position might well be taken by the War Department as respects enlisted men of no special qualifications.

With regard to officers of the Army and of the Navy who hold life positions and who if found incapacitated for duty must be supported on the retired list, the situation is very different. Since positions can be found for officers in which their special qualifications may be made use of even though their health may not become completely reestablished, it is considered advisable that cases of only moderate severity should not be disposed of by retirement unless a protracted period of treatment shall have proved unavailing to effect the arrest of their disease.

PROPHYLAXIS OF MALTA FEVER.

ALMOST nothing has been reported, as yet, touching actual attempts at prophylaxis. The analogy between Malta and typhoid fevers, the presence of cocci in the urine of one and of bacilli in the other suggest at once the advisability of the use of urinary antiseptics of the formaldehyde group to combat the spread of Malta fever.

Contemporary Comment.

THE UNITED STATES ARMY PERSONAL IDENTIFICATION SYSTEM.

THE system of identification ordered for the United States army is now in active operation, being employed in the case of every enlisted man now in the military service and of every man who may hereafter enlist or reenlist in the service.

The plan is based upon finger prints, supplemented by a photograph and a brief personal description, as shown in the completed blank facing this page, which is an exact facsimile of the sample record furnished by the War Department. The advantage of the finger print as a means of identification lies in the fact that, as shown by Galton, the papillary ridges on the palms of the hands and soles of the feet, in which are situated the mouths of the sweat glands, are (1) clearly developed in the newborn child, (2) permanent throughout life and as long after death as the epidermal structure remains undestroyed by putrefaction or other causes, and (3) the patterns produced on the finger bulbs are unique and characteristic for each individual.

After the record has been completed it is forwarded to the War Department in Washington and duly classified, according to Kean, as follows:

The patterns of finger prints are divided into two general classes, loops and whorls. In the former are included the arches and in the latter the composites. Each of the ten prints will be then, either a loop or a whorl, designated L or W, respectively, and the ten digits, being taken in pairs, there will be four possible combinations of each pair, which are written as a key in this manner:


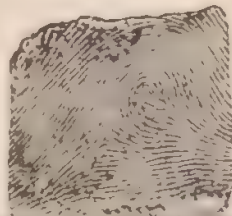
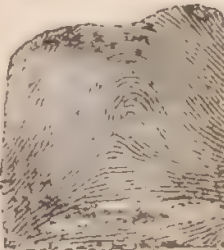
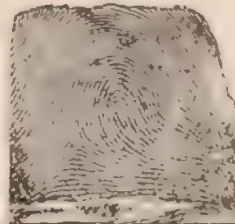
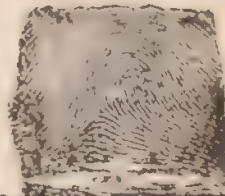
LL	LW
WL	WW

Since we have the same number of combinations for the second pair, each of which can be combined with each arrange-


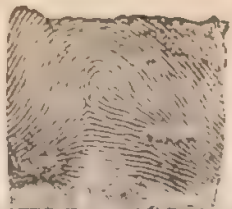
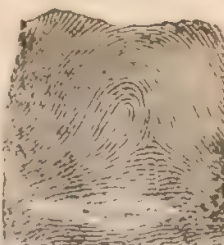

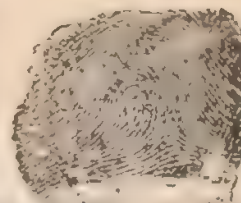
N. B.—Do not write on this side of the sheet.

Classification No. _____

RIGHT HAND.

1. Thumb	2. Index	3. Middle	4. Ring	5. Little
				
FOLD ON THIS LINE.				

LEFT HAND.

6. Thumb	7. Index	8. Middle	9. Ring	10. Little
				
FOLD ON THIS LINE.				

LEFT HAND.

Plain impression of the four fingers taken simultaneously.

RIGHT HAND.

Plain impression of the four fingers taken simultaneously.



SPECIMEN OF FINGER-PRINT RECORD AND PERSONAL DESCRIPTION.

SPECIMEN OF FINGER-PRINT RECORD AND PERSONAL DESCRIPTION.

DOE, JOHN R.
(Print an name.)

Pvt. A 15th Infy
(Rank and organization, or title, as Private, etc.)

Enlisted *January 6*, 1906.

At *Washington Bldg, D.C.*

Date of last prior enlistment *Jan. 6, 1903.*

Race *White*; height *67 1/2* inches.

Date of birth *May 17, 1875*

Finger prints taken *Jan. 6*, 1906.

At *Washington Bldg, D.C.*

By *Richard Roe*

Capt. & Asst. Surg. U.S.A.

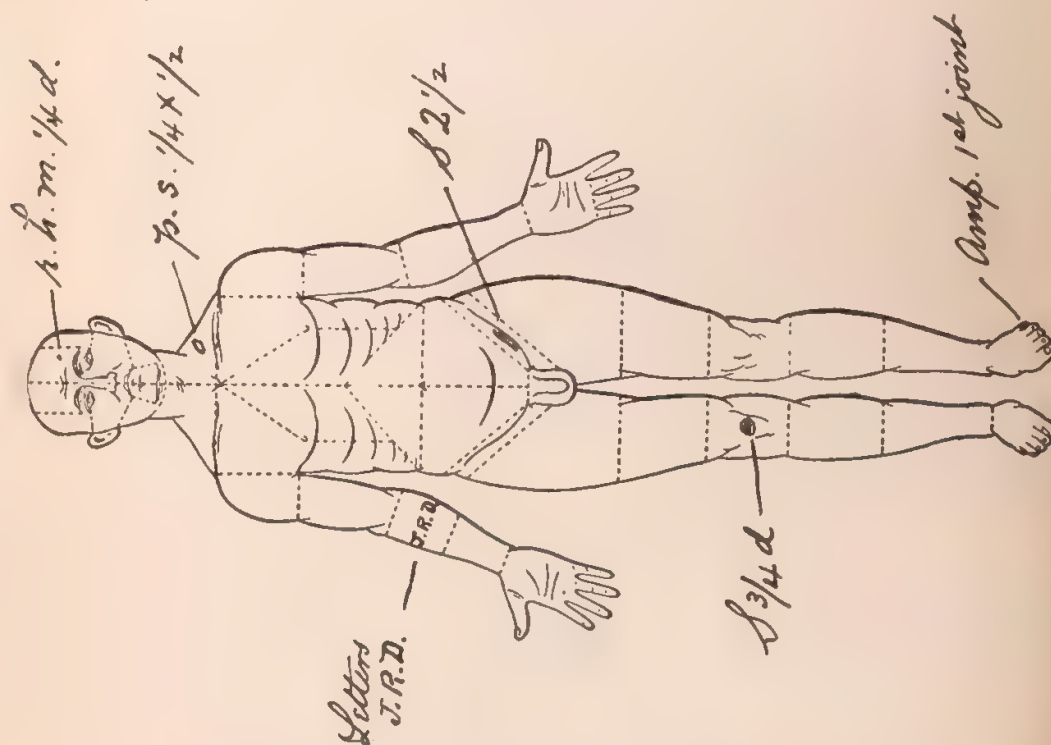
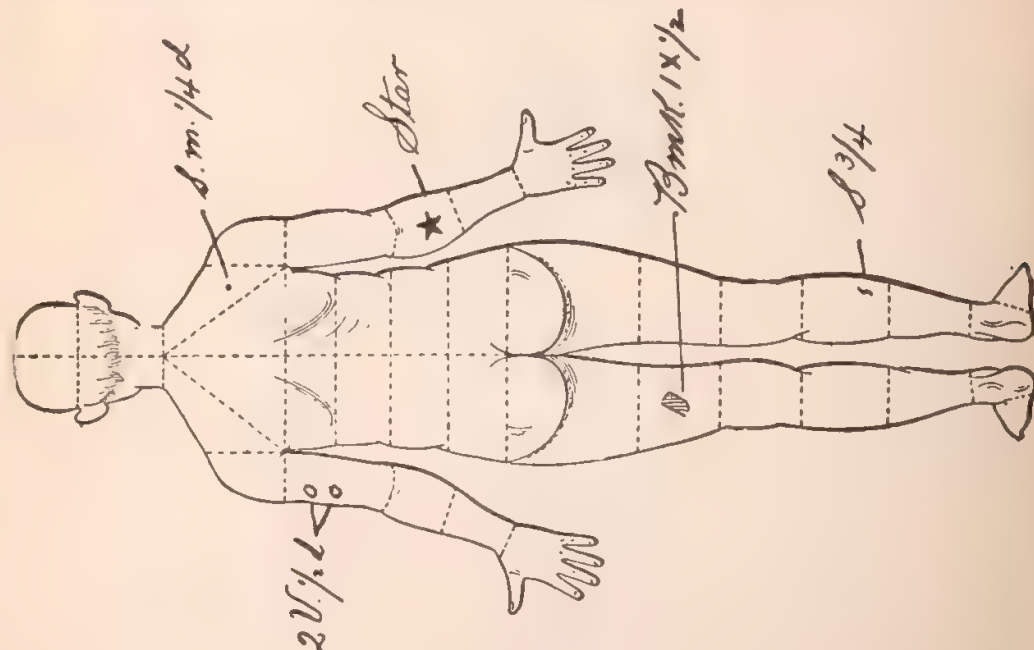
When completed, mail this form, with photograph and photographic negative of the soldier, to The Military Secretary of the Army.



Print of right index finger, to be taken immediately after signature of soldier is written.

Signature of soldier:

John R. Doe



ment of the first pair, the total number of combinations will be sixteen for the two pairs; sixty-four for three and 1,024 for the five. This number being the square of thirty-two, a cabinet containing thirty-two sets of thirty-two pigeon holes each will be necessary for all combinations of the loops and whorls of the ten digits taken in pairs. This cabinet is divided into four quarters by a vertical and a horizontal bisecting line, each containing 256 pigeon holes, each quarter in the same way into four eighths, each eighth into four sixteenths, and each sixteenth into four thirty-seconds, containing four pigeon holes apiece.

If the finger print is received for file in which, for example, the right thumb is a loop, the index a whorl, the middle finger a whorl, the ring finger a loop, the little finger a loop, the left thumb a loop, the left index a loop, and so on, the formula for the print would be LW, WL, LL, WW, LW. By reference to the key above given, the first pair of letters, LW would be seen, to be in the upper right quarter of the key, which would locate the card in the upper right quarter of the cabinet. The second pair, WL, would further locate it in the lower left sixteenth; the third pair, LL, in the upper left sixty-fourth division; the fourth pair, WW, in the lower right two hundred and fifty-sixth division, and the fifth pair, LW, in the upper right pigeon hole of that division.

To subclassify the cards in a pigeon hole from each other and break up large accumulations in one compartment of the above primary classification, a secondary system of classification is made based on the occurrence of arches and loops which are radial or ulnar in position with reference to the index finger or fulcrum.

A still further differentiation is made by counting the number of ridges which intervenes between characteristic fixed points in the impression of a finger, known as the inner and outer terminus, and by noting other characteristics of the ridges with reference to them. For the details of this method the reader is referred to the little book on the subject by Henry.

An expert in searching for a duplicate by these methods can

find it in five or six minutes if it exists in a record of 100,000 cards.

The instructions for preparing the records, as issued by the War Department, are as follows:

The necessary apparatus and supplies for making the records will be furnished by the Surgeon General to medical officers of the Army, who are charged with the duty of making and forwarding the required records. Commanding officers are enjoined to take such steps as may be necessary to insure prompt and complete compliance with the requirements of the general order prescribing them, and inspecting officers are charged to make special inquiry and report as to whether those requirements have been met.

When a medical officer completes and forwards the identification record of an enlisted man of any company or detachment, he will so notify the company or detachment commander in order that that commander may make the required entry of "Identification record made" on the soldier's descriptive list, military record, and statement of accounts. At recruit depots or depot posts the medical officers will themselves make this entry on the descriptive and assignment cards of recruits, these cards being sent to the medical officers for that purpose when recruits are sent to them to have their identification records made.

The outline figure cards formerly in use have been discontinued, and hereafter in every case the complete identification record, consisting of finger prints, personal description of the soldier, photographic negative and one print of the negative, will be made and forwarded, all together, to The Military Secretary of the Army. In no case will the entry of "Identification record made" be placed on a man's descriptive and assignment card or on his descriptive list, military record, and statement of accounts until the complete identification record, herein specified shall have been made and forwarded.

The following instructions are published for the information and guidance of all concerned in making and forwarding identification records. The instructions relative to the photographic portion of the record were prepared by Maj. Edgar Russel, Signal Corps, after extended experiments with the photographic apparatus and supplies to be issued by the Surgeon General. It is believed that these instructions, if closely followed, will produce good results, but if in actual practice they should be found to be defective in any way report of the facts will be made promptly to The Military Secretary of the Army.

FINGER PRINTS AND PERSONAL DESCRIPTION.

The form (Form No. 260, M.S.O., reproduced facing page 480) adopted for recording the finger prints and personal description is made to carry the finger print record on one side and the personal description on the other.

It is absolutely necessary that the finger prints shall be clear, that the ridges shall be distinctly outlined, and that the "rolled" impressions shall be sufficiently large to include all the points needed for accurate classification. Those points are shown in "Classification and Uses of Finger Prints," by E. R. Henry, which book should be carefully read by the operator before he begins to take impressions.

The apparatus for taking finger prints consists of a form holder, an ink plate, and a roller for spreading the ink on the plate. The roller and ink plate must be kept clean and free from dust, grit, or hairs, and the ink tube should be kept closed when not in use. The ink should be cleaned from the plate and roller, by means of a cloth wet in benzine, when the day's work with them is finished. When the roller is not in daily use it should be rubbed with a little sweet oil or lubricating oil before it is laid away. This will prevent the composition from becoming too hard.

Preparatory to taking the finger prints of a subject, a small quantity of ink should be squeezed from the tube and carefully worked, by use of the roller, into a thin even film on the plate. The spreading of the ink will be facilitated by frequently turning over the roller. If too much ink is used the impression will be blurred and, consequently, unsatisfactory. The quantity of ink that will produce the best results, and the most satisfactory method of spreading it on the plate, as well as the amount of pressure necessary to properly ink the finger and to make the record impression, can be determined by each operator from a few preliminary experiments. It is suggested, therefore, that before the operator attempts to take record impressions he experiment on a plain sheet of paper, with a surface similar to that of the record blank, until he is able to take impressions that are clear and satisfactory.

There are two kinds of impressions, "plain" and "rolled." A plain impression is obtained by pressing the bulb of the finger, with the plane of the nail parallel to the plane of the plate, on the inked plate and then on the paper in the same manner. A rolled impression is obtained by placing the side of the finger on the inked plate, with the plane of the nail at right angles to the plane of the plate, and rolling the finger over from one side to the other until the plane of the nail is again at right angles to the plane of the plate, but with the bulb surface of the finger facing in the opposite direction, thus inking the surface of the finger, and then rolling the finger over the paper in the same manner, in this way obtaining a clear impression of the ridges on the surface of the finger. That impression should include both the palmar surface and the sides of the finger between the tip and the flexure of the last joint.

In taking impressions, the operator himself should manipulate the hands of the subject, who should be directed to relax his fingers and not to attempt to assist by adding to the pressure on the inked plate or on the paper. In order that the ink may be taken up on the finger evenly and in

sufficient quantity, an unused part of the plate should be selected each time for inking the finger, and when no unused part of the plate can be found readily the ink should be redistributed with the roller or the plate reinked.

Care should be taken to see that the bulbs of the fingers of the subject are clean and dry before attempting to take impressions of them.

The form holder, which is intended to prevent the form from moving about and blurring the print while impressions are being taken, should be used in all cases. It should be fastened on a table or desk of sufficient height to enable the operator to work easily while standing. The best results can probably be obtained with a table that places the form holder at about the height of the elbow of the subject when he is standing with his arms hanging at his sides. To place a form in the holder, press out the plate by means of the levers at the ends, place the form in position under the plate, and push back the levers to their original position. The pressure of the springs on the plate will hold the form firmly in position.

To record the finger prints on Form No. 260, M. S. O., place one of the blank forms in the holder with upper "fold on this line" appearing just above the upper edge of the plate. Then take the rolled impressions, in the order named and in the proper spaces on the form, of the thumb, index, middle, ring, and little fingers of the right hand. The impressions should be located on the form so that the flexure of the last joint is immediately above the folding line. This will leave room for a second print to be taken in the upper part of the space in case the first print is defective. If any finger is missing, or is injured or deformed so that an impression can not be obtained, the space for that finger should be left blank, and the defect noted in connection with the personal description.

After the impressions of the fingers of the right hand have been taken, move up the form in the holder until the lower "fold on this line" appears just above the edge of the plate. Then take the rolled impressions of the fingers of the left hand in the proper spaces on the form.

After the rolled impression of each finger of both hands has been obtained, again move up the form in the holder until the plate covers only enough of the lower edge of the form (not exceeding $\frac{1}{4}$ inch) to hold it in place. Then take a plain impression of all the fingers of the right hand at one time, the fingers being held together so as to bring the prints within the allotted space, and a similar plain impression of the fingers of the left hand.

When the finger-print side of the form has been completed, the impressions should be inspected to make sure that they are clear and that the rolled impressions include the whole of the pattern. The rolled impressions should also be compared with the plain impressions for the purpose of ascertaining whether they are recorded in proper sequence. Any defective impressions can then be remedied by taking another print in the upper part of the proper space, or by using a new form if necessary. If the impressions

are not recorded in proper sequence a new form should be used, the old one being destroyed.

After the finger prints have been taken and examined, the brief on the opposite side of the form should be filled up and the personal description completed by noting on the outline figures, in the manner indicated in the "Manual of the Medical Department," the principal identification marks.

The soldier should then be required to sign his name in the place provided for "signature of soldier" and to make a plain impression of the index finger of the right hand in the space reserved for that purpose. That impression should be taken without using the holder as there is liability to blur the other impressions in replacing the form in the holder.

Before making the entries on the personal description side of the blank, however, the ink on the finger-print side should be allowed to become sufficiently dry to prevent blurring by rubbing. A few minutes will be sufficient if the form is handled carefully and not rubbed about on the desk while the personal description is being entered. A sheet of blotting paper placed under the form will protect it to some extent. If an impression becomes blurred at any time a new impression should be taken in the upper part of the proper space, or if necessary, the imperfect form should be destroyed and a new blank used.

A specimen of the finger-print record properly completed faces page 480.

The completed form, folded on the lines marked "fold on this line," with the photograph and photographic negative of the soldier inclosed in a jacket (Form No. 261, M. S. O.), should be mailed promptly in an ordinary penalty envelope, without letter of transmittal, to The Military Secretary of the Army. If the identification records of more than one soldier are obtained the same day they may be forwarded in one envelope.

PHOTOGRAPH.

The negative.—This is made on a film $4\frac{3}{4}$ by $6\frac{1}{2}$ inches in size. Two bust pictures, one full front view and the other exactly in profile, are made on this film by means of a sliding lens board on the camera. The distance of the sitter from the lens and the focal length of the camera are such that the reduction is one-seventh. The negative, when completed, is to be trimmed so that the top is $\frac{1}{4}$ inch from the top of the head of the image and to a width of three inches, keeping the negative its full length of $6\frac{1}{2}$ inches.

Prints.—These are made on developing photographic paper of the kind known as "gaslight paper." Sheets of this paper 3 by $5\frac{1}{2}$ inches in size are furnished and need no trimming. Herewith is a reduced reproduction, of the form of photograph that has been adopted as a part of the identification-record system.

Rooms.—In order to secure uniformity of lighting, and consequently uniform negatives from all posts, flash-light illumination has been adopted for identification negatives, except at depots where other means may be employed. For flash-light photography it is necessary, as far as practicable,

to shut out daylight from the room when the pictures are taken, although dim, diffused daylight, if not too bright, will do no harm. The minimum dimensions of the room suitable for the work are 9 by 12 feet. Light walls are rather preferable but are not essential. All windows should be provided with opaque shades. Black, dark green, brown, or red are suitable shades. The room should, however, be provided with nonactinic light, such as gas (*not* acetylene or Welsbach), incandescent lamp, or oil lamp, placed back of the camera and to the left of the sitter. This light lessens staring of the eyes as an effect of the flash light and does not affect the plate for some little time, even when the cap is off the lens. A dark room or closet should be fitted up, preferably adjacent to the room where the sittings are made. If possible the dark room should be provided with a sink and



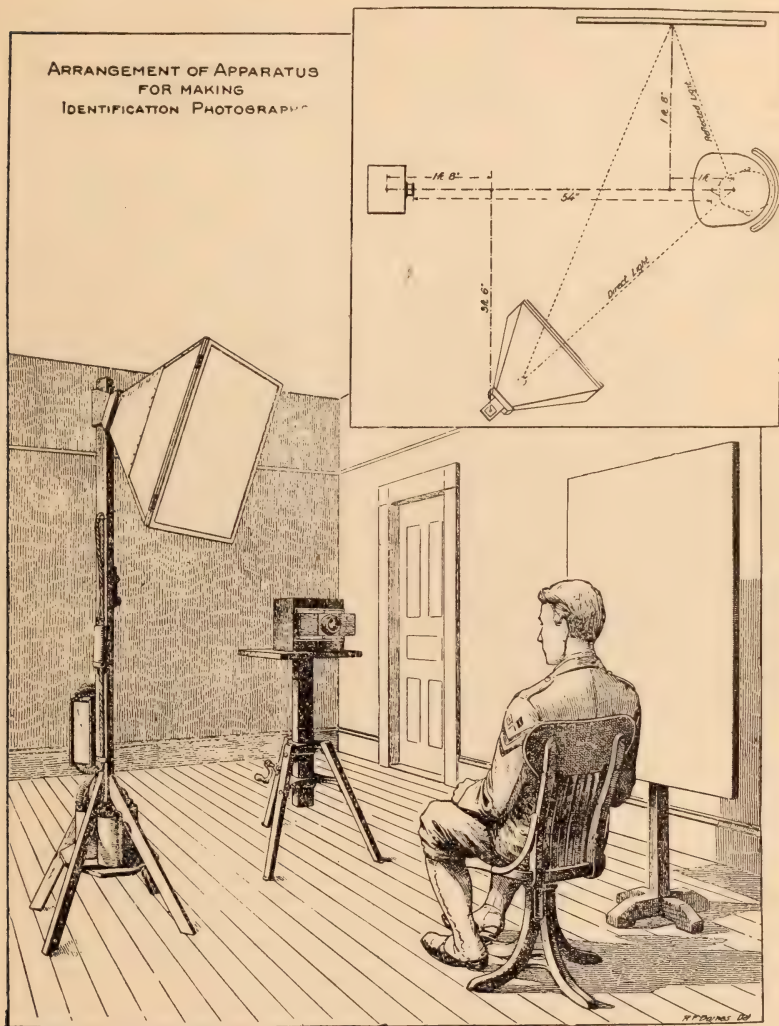
Photographic Element of the Identification-record—reduced.

The regulation photograph measures $7\frac{1}{2}$ by 14 centimeters.

running water, with shelves for graduates and bottles above the sink, and with waterproofed drain boards on each side for the developing and fixing trays. The ruby lantern should be hung just above the drain board upon which the developing is done. A low broad shelf or table upon which to place printing frames, boxes containing photographic papers, etc., should be provided in the dark room. Outside the dark room, in some airy place free from dust, there should be stretched a number of horizontal cords upon which may be hung the wooden clips for holding the negatives and prints while drying.

Herewith are diagrams showing the proper arrangement of the apparatus for making identification photographs and a suggested arrangement of sink and shelves for the dark room.

In connection with the carpentry necessary for fitting up the dark room, the stand for the flash-light holder, and the frame and support for the white sheeting reflector, hereinafter described, should be made. These are prefer-



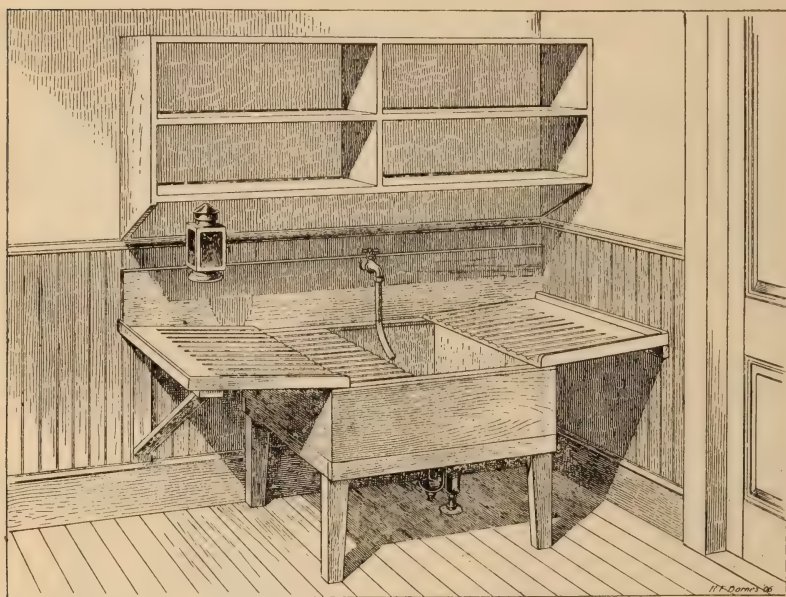
Arrangement of Apparatus for making Identification Photographs.

sheeting reflector, hereinafter described, should be made. These are prefer-

ably of white pine and will conform to the diagrams and descriptions accompanying the apparatus.

Camera and stand.—The camera is made without a bellows, as it is always to be used with the sitter at a fixed distance from the front of the lens. The lens has no variable diaphragm. It is mounted on the slide which brings the images into proper positions on either of the two halves of the $4\frac{3}{4}$ by $6\frac{1}{2}$ inch films. No focusing is required. The camera is screwed to its place, pointing to the center of the gray background, about 8 feet distant.

The revolving chair is placed so that the sitter, when leaning lightly



Suggested Arrangement of Sink and Shelves for Dark Room.

against the back of the chair, faces the camera squarely. The face should be 54 inches from the lens. The camera should be so adjusted vertically that the lens is about on a level with the point of the chin of the average sitter.

Reflector.—Is made of white sheeting tacked to a light wooden frame three feet wide and four and one-half feet long, as shown in the accompanying diagram of "Arrangement of Apparatus for Making Identification Photographs." When fastened to the stand, the top of the frame should be six feet from the floor. The reflector is placed 20 inches to the right of the

sitter, slightly to his front and nearly parallel to a line joining the lens and the sitter.

Background.—The gray material furnished is for the background and may be tacked to a light wooden frame or put up against the wall. In any case it should be put up smoothly.

Flash-light stand and holder.—The holder is made of light wooden framing with tin at the back. The hinged front and part of the sides are covered with translucent tracing cloth. This should be frequently brushed and wiped with a clean cloth on the inside to keep the white dust from the flash powder from rendering it too opaque. *This is important*, as an accumulation of dust cuts down the lighting materially.

The flash-light stand should be placed as shown in the accompanying diagram of "Arrangement of Apparatus for Making Identification Photographs." It should be three feet to the right of the camera, the holder pointing at the sitter. The front of the holder should be about 40 inches from the sitter, and its center about 5 feet 10 inches high.

The spark coil screwed to the upright of the stand is of the automobile jump-spark pattern. This is used for firing the flash-light cartridges. It is sent out adjusted and should give a good buzzing sound when the primary is connected with the five dry cells furnished and the push button is pressed. The secondary is connected to the binding posts on the plug, and if the coil is working properly a stream of vivid sparks should jump across the igniter-plug terminals when the push button is pressed. To use it, place a flash cartridge on the plug and carefully insert the plug in the tube at the bottom of the holder, turning the plug so as to engage the catch. Pressing the button will cause the sparks to puncture the paper on the bottom of the cartridge and ignite the powder.

Taking the picture.—Having secured the camera, revolving chair, flash-light stand, reflector, and background in position, the film pack is placed in the holder with the slide in place and the "safety cover" paper drawn out. The holder is placed in the camera, the lens slid over to the left side and *capped*, and the slide drawn from the film-pack holder. The sitter is placed squarely facing the camera. He leans lightly against the back of the chair and looks at the top of the camera.

Before taking his place, the name of the sitter, his rank, and organization, or statement of his being an unassigned recruit, if so, should be written with chalk on the black slate or coated cardboard (12 by 6 inches) and hung around his neck so that the top of the slate is about on a line with the ends of the shoulders.

A flash-light cartridge is placed white side down on the igniter plug and the plug inserted.

The lens cap is removed and the button on the flash-light stand pressed, thus making the exposure. *The lens is at once capped* and then slid over to its position on the right. The sitter turns 90 degrees to his left, bringing

the right side of his face toward the camera. Another flash-light cartridge having been meanwhile inserted in the holder, the lens is uncapped, the flash made, and the lens at once capped. The No. 1 paper tab on the film pack is pulled out as far as it will come and torn off, thus bringing an unexposed film to the front.

If sitters succeed each other, as many as four may be photographed before the smoke in the flash-light holder will become too thick to cut down the light appreciably. After this the holder must be lifted from the stand and taken out of the room, the front opened, and the smoke blown or fanned out. It can then be brought back and replaced on the stand. When the sittings are finished, *replace the slide in the film pack holder*, which can then be taken out and to the dark room.

Developing and fixing—The contents of one developer cartridge are to be dissolved in 5 ounces of water and the solution poured into the tray, which is to be used *for developing only*.

As it is necessary to maintain the developing solution at about 65° F, there is provided a box with wire netting on which the tray can be set. This box is filled with slightly warm water when the temperature of the developer tends to remain lower than 65 degrees, or with water and lumps of ice when the temperature tends to go higher than this.

The enameled tray is set on the wire netting with the warmed (or cooled) water rising about $\frac{1}{2}$ inch over the wire bottom. The temperature of the developer should be frequently tested with the thermometer furnished for the purpose.

The contents of one fixing cartridge are to be dissolved in sixteen ounces of water and the solution poured into the fixing tray (*which is used for this purpose only*) and placed well away from the developing tray.

The ruby lantern having been lighted, close out all other light.

Wash the hands free from all chemicals, especially those of the fixing bath, and dry them.

Take out the film pack from the holder. Break the seals at the lower corners and open the lower end. The exposed films will be found in the back of the pack and can be easily removed. The end of the pack is then replaced and the pack put back in the holder and closed. The exposed films will have part of the paper tabs still attached. *These are to be torn off.* A film is then placed in the developer, dull side down, the immersion being made without pausing, the film then being turned over and brushed with a wad of absorbent cotton to detach any air bubbles. Note exactly the time of the immersion. The "high lights" (collar or other white objects) should begin to appear as faintly dark places on the film in about forty-five seconds.

Rock the tray gently during development, which should take eight minutes at 60° F. and six minutes at 70° F. The best temperature is 65° F., with which the development should be complete in seven minutes. Dur-

ing development the tray should be shielded from the direct light of the lantern, except for examination of the negative.

Take out the negative, rinse it a moment, and then place it face down in the fixing bath.

It should be moved about occasionally and should be fixed in ten minutes.

When the negative is fixed there should be no whitish patches left on it. As soon as the negative has been placed in the fixing bath its sensitiveness to light ceases and the dark-room door may be opened. When fixed, the negative should be washed in running water for one hour, or be put through a dozen changes of water extending over the same period. It should then be hung by one corner with a wooden clip on the cord to dry and should not be permitted to touch anything while drying.

All specks of dirt should be rinsed off the negative before it is hung up to dry.

A number of negatives can be developed at the same time. In this case it is advisable to dissolve two cartridges in 10 ounces of water in order to have enough developer to cover them. The exact time of immersion of each must be noted and they must be removed in the proper order. During development they must be continually taken out and replaced successively in the tray so that the developer will act alike on all the films. Ten ounces of developer solution can be used for about ten films if developed at once, or one immediately after another.

The developer should not be used when over a few hours old and should always be poured out when development of a batch is finished.

In fixing a number of negatives they should be moved about in the fixing bath occasionally during the process.

In washing see that the negatives are moved about, otherwise portions will be imperfectly washed. The fixing bath can be used repeatedly 16 ounces of the solution being good for about two dozen negatives. It can be poured into a stoppered glass jar and saved, if not exhausted, when developing and fixing are completed. When it takes over twelve minutes to fix negatives at ordinary temperature the fixing bath is getting weak and a fresh one should be made up.

Printing.—Prints made from a negative before sending it to The Military Secretary are to be made on what is known as "gaslight" or "developing" paper, many varieties of which are now on the market. The image is obtained by momentary exposure and is subsequently developed like a negative. The requisites for this class of work are: (1) A printing frame fitted with a sheet of clear glass $3\frac{1}{8}$ by $6\frac{3}{8}$ inches; (2) a board provided at one end with cleats to hold the printing frame, there being at the other end an alcohol lamp, one or two sheets of ground glass, according to the density of the negative, being interposed, in the center, between the printing frame and the lamp; (3) short bits of magnesium ribbon for burning in the alcohol

flame, with a metal clip for holding them: (4) a special developer cartridge, for paper, holding enough to make up five ounces of solution: (5) a fixing bath the same as that used for the film negatives: (6) a washing tray: (7) horizontally stretched cords and clips for holding the prints while drying.

The exposure and development of the prints do not demand such careful exclusion of light as is required in treating the film negatives. It may be said in general that the development is best done about five feet away from an ordinary coal-oil lamp, gas flame, or 16 candlepower incandescent lamp. Daylight or other very actinic light should, however, be avoided.

The most convenient way in which to proceed is to have two paper boxes with covers, one for unexposed paper needed for the batch of prints and the other for the exposed papers. Keep the covers on these boxes during the progress of the work, except for the moments needed for putting in or taking out the papers.

Place the negative, dull side uppermost, in the printing frame on the glass. Put a sheet of the sensitive paper, glossy side down, on the center of the negative and close the frame. This can be done in a few seconds, and if 5 or 6 feet from the shaded light it will not fog the paper. Then stand the printing frame in the cleats on the printing board fronting the ground glass. Having lighted the alcohol lamp, take care that the wick of the same is pushed down until the flame is not more than $\frac{3}{4}$ inch high. Take a bit of the magnesium ribbon and, holding it by the *extreme end* in the metal clip, put the outer end of the magnesium ribbon in the tip of the alcohol flame. It will soon take fire and burn for a moment with a dazzling white light. Hold the clip in place until the magnesium is completely burned, for by this means alone can uniform exposure of the prints be obtained. Care must be taken that the light from the burning magnesium ribbon reaches the printing frame only through the sheet of ground glass. Proceed in this way until all the prints are finished. Always keep the cover on the alcohol lamp when it is not in use.

Dissolve the contents of one tube of *developer for paper* in five ounces of water and pour it in the developer tray. Place the tray in the temperature regulating box and fill the box up to $\frac{1}{2}$ inch over the wire netting with ice and water in warm weather (or warm water in cold weather) until the temperature of the developer marks 65° F., which should be maintained as nearly as possible.

Take an exposed paper and quickly insert it *completely*, face down, in the developer, immediately turning it face up and brushing it with a swab of absorbent cotton to do away with air bubbles. The image should begin to appear at once, and if the exposure has been right, development should be complete in from 20 to 30 seconds. Plunge the print for an instant into the washing tray and then put it face down in the fixing bath. After a few seconds it may be turned face up, when its sensitiveness to actinic light ceases, as noted in fixing the negative. It should be moved about in the

fixing bath occasionally. Fixation is complete in about eight minutes, at the end of which time all yellowness of the print should be gone.

When the prints are fixed they should be washed in running water for one hour or in a dozen changes of water in the same period. They should not be allowed to lie long one on top of another in the washing tray, but should be frequently moved about.

After washing, the prints are to be hung up with wooden clips to dry, care being taken to make the marred place produced on the corner of the print by the clip as small as possible.

The curl may be taken out of the prints when dry by placing them face down on a clean blotter and drawing them out under the rather blunt edge of a paper cutter or metal edged ruler.

About eighteen prints may be developed successively in the five ounces of developer solution, but the solution should never be more than a few hours old. The 16-ounce fixing bath will fix about five dozen prints. The fixing bath when not exhausted, unless it becomes very dark and muddy, should be saved in a stoppered jar.

In general good results will be secured only by attention to details and by order and cleanliness in the manipulation of apparatus and chemicals.

The flash-light apparatus should be attended to frequently and the white dust wiped off the inside of the translucent material. If necessary, the flash-light holder should be freshly covered occasionally. The failure of the sparking coil is generally due to exhaustion of the battery.

Stains, spots and streaks on negatives or prints may be caused by damp or dirty hands touching the dry films or paper on the sensitive surface, by failure to immerse the films or paper promptly in the developer, by air bubbles, by not rocking the developing tray, or by prints lying one on top of another during fixing or washing.

Always wash the hands after touching the fixing bath.

Too much care can not be taken in regard to temperature of developer. The amount of water used and times prescribed are based on many experiments in which the standard illuminants were used. These being fixed every thing in the average results secured depends upon maintaining the prescribed temperature of 65° F.

One of the principal reasons for requiring prints to be made from negatives before sending them to The Military Secretary of the Army is to render it certain that all negatives sent to him shall be such that good, clear, strong prints can be made from them. Whenever, therefore, it is found that any negative does not yield such a print readily the sitter will be rephotographed and the old negative destroyed. In no case will an identification record be recorded or regarded as completed until there has been obtained a negative from which a satisfactory print has been made. Until such a print has been made the sitter will be held subject to recall by the medical officer making the record. Medical officers are enjoined to exercise great care in these particulars and will be held to a strict accountability for failure to do so.

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Editorial Expression.

THE SANITARY WORK OF THE JAPANESE DURING THE LATE WAR IN THE ORIENT.

IN the *Sei-I-Kwai Medical Journal* Surgeon General Koike publishes a paper very much along the line of the note contained in the present number of the JOURNAL by Surgeon General Suzuki, in which we may note that the Japanese rejected pills, powders and liquids as much as possible, substituting for them tablets prepared in their own medical supply depot, where also were made the so-called "seiro gwan" (a form of pill) and sterilized injections. The dressing materials were prepared largely by volunteer nurses who gladly gave their services for the purpose, Her Majesty the Empress and Her Highness the Crown Princess with the court ladies personally engaging in the work and contributing no less than 42,400 boxes.

Professor Koike remarks that the Russians never retreated before a frontal attack of the Japanese so that the latter often could not remove the wounded except under cover of darkness, the lapse of time having a bad influence upon the result of the treatment. In the battles before Port Arthur some of the Japanese wounded were exposed in this way for no less than nine days.

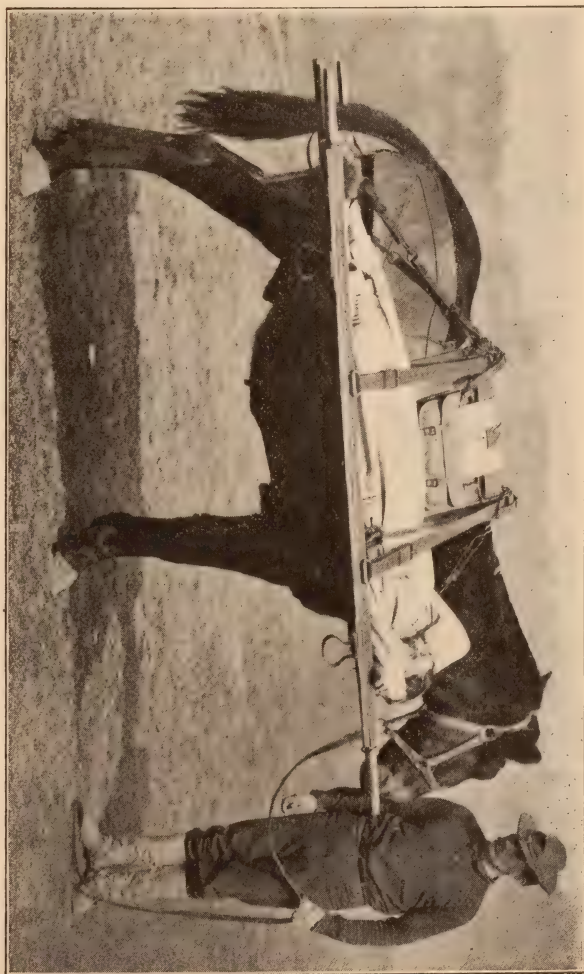
The "seiro gwan" pill was the result of the study of the Army Medical Department in the direction of prevention of disease, its action being directed toward infectious diseases of the intestines. The "seiro gwan" were distributed to every soldier of the Army and directed to be taken regularly after meals. It did not prove to be an absolutely effective agent, but it never had any dangerous action and was generally regarded as markedly efficient, its use increasing among the soldiers until a supply of 2,000,000 a day could not fulfill the demand.

PACK TRANSPORTATION OF THE WOUNDED.

THE Drill Regulations for the Hospital Corps of the United States Army have omitted the consideration of transportation of the wounded by pack animal, owing doubtless to the necessity of technical skill in applying the pack saddle

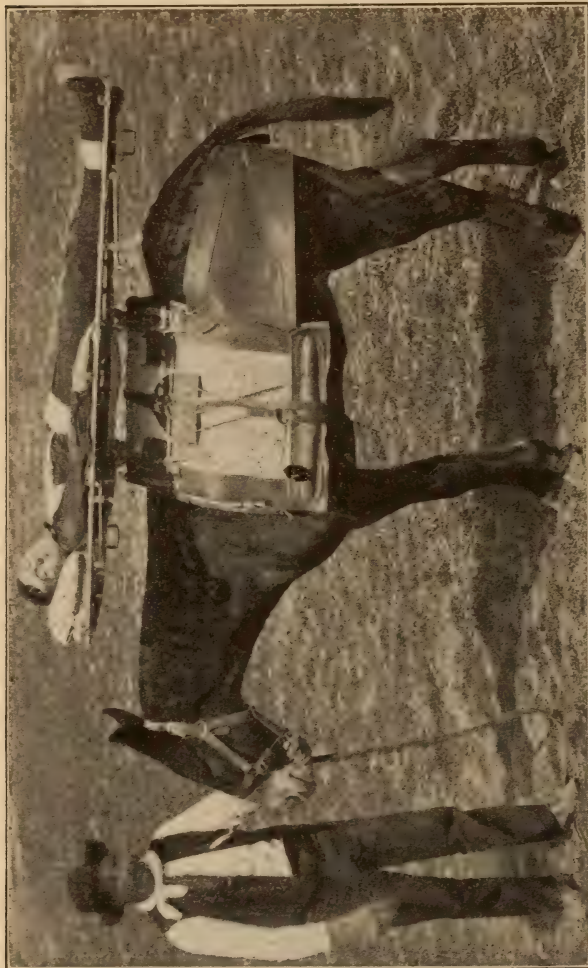
or aparejo, the travois being the only prescribed method of transporting the wounded upon a litter. Methods have been devised however of transportation by pack saddle and these are, if available, in reality superior to the travois. In an interesting article by Mr. H.

Transportation of Two Litters with Patients upon an Aparejo.



W. Daly, Chief Packer of the Army, (*Journal of the United States Cavalry Association*) two photographic illustrations are given of

these methods. They do not claim to be original since they have been presented many times during the past, but their value justifies their reproduction at this time, as examples of what may be done in case of the availability of pack transportation.



Transportation of Single Litter with Patient, upon an Aparejo.

The aparejo may also be used as a support for chairs or cacolets, to be swung on either side of the animal as a support for patients who may be carried in a seated or semi-recumbent posture. It may also be employed with a two-horse litter, although ordinarily

ly, conveyance by a single animal is better, when practicable. In the matter of conveyance by single animals, the aparejo, with its opportunity for the attachment of the regulation litter, litters, or chairs would appear to be the *ultima thule* of transportation.

THE ETIQUETTE OF MILITARY CORRESPONDENCE.

THE technique of military correspondence is a matter that is sometimes rather difficult for newcomers in the service to understand. It is based however upon mutual courtesy and the military relations of the correspondents, and in this connection the following letter from Brigadier General Alfred A. Woodhull, U.S.A., a distinguished retired medical officer is of interest:

Sir:—A paper in *THE JOURNAL* for October, 1906, quotes (p. 353) an endorsement by a Post Adjutant upon a Sanitary Report, as "showing the spirit of opposition accorded these [medical] officers." I think that is not a necessary inference. The Medical Officer's communication ran: "The Commanding Officer's attention is respectfully called, etc." This was regarded as objectionable in form, as it was. It is a fundamental point of military etiquette, one may say of administration, that a junior cannot "call" the attention of his superior to any subject. To call implies the exercise of authority, or control. It is an immemorial and seemly custom for the junior to "invite," or to "request," the Commanding-Officer to do something, not to "call" upon him to do it, or even to observe it. In this instance the Commanding Officer was giving the Medical Officer a lesson in decorum. Of course he might have sent for him and explained what was not, and what was, proper in military correspondence; but under any circumstances the objectionable phraseology should be eliminated. And those words, "objectionable phraseology," exactly explain the condition in that particular case. It does not at all appear that the Commanding Officer took exception to what was desired, but to this indecorous method of bringing it to his notice.

One of the serious disabilities under which junior medical officers labor, is ignorance of military custom. Our young men enter a peculiar society, which is absolutely novel to them; and frequently they have no competent or interested monitor. Such men often are chagrined and disappointed, sometimes they have their feelings hurt, because they have ignorantly crossed a barrier or trespassed upon forbidden ground. They simply do not know. It is to be hoped that a competent course upon the Usages of the Service is among those supplied by the Army Medical School. Nor is it only junior officers who thus offend. Some men never learn. They are constantly in trouble over just such apparently minor matters. They do not appreciate the refinements of intercourse, nor recognize that a rapier may be as effective as a broadsword. It is equally true that some officers of the line are careless as to such niceties, and either do not know or do not appreciate what is due to the places they may be filling. But that is not our concern, excepting as by such indifference they may lead the young men of the Medical Corps into error by establishing a precedent that will fail them in practice. As a rule the peculiarities, as they appear to civilians, of military life are founded in reason. It is possible that such peculiarity may interfere with efficiency, but that rarely happens.

Returning to the specific paper, it does not seem judicious to misinterpret the ordinary rules of procedure as indications of opposition or hostility.

Respectfully, ALFRED A. WOODHULL.

News of the Services.

Passed Assistant Surgeon F. S. Abeken, U.S.N., commissioned to date from June 10, 1906.

Captain John D. Allen, U.S.A., ordered from Fort Sill to Newport News for duty with Field Hospital No. 10 in the Cuban expedition.

Dr. Roger P. Ames, U.S.A., ordered from Fort St. Philip to Jackson Barracks for temporary duty.

Passed Assistant Surgeon J. W. Backus, U.S.N., ordered from the *Franklin* to the *Texas*.

Dr. C. L. Baker, U.S.A., ordered from Honolulu to Fort Totten.

Dr. E. Bailey, U.S.A., relieved from duty in the Philippines and ordered to Fort H. G. Wright.

Captain C. J. Bartlett, U.S.A., promoted from Lieutenant, September 21, 1906, and ordered from Fort McDowell to accompany the 18th Battery, Field Artillery, on the Cuban expedition.

Dr. William K. Bartlett, U.S.A., ordered from Minneapolis, Minn., to the Army Medical School for instruction.

Dr. R. P. Bell, U.S.A., ordered to Fort Monroe.

Surgeon William H. Bell, U.S.N., ordered to special duty in the Bureau of Medicine and Surgery.

Surgeon F. L. Benton, U.S.N., ordered from the Pensacola Naval Hospital to the *Texas*.

Captain James L. Bevans, U.S.A., ordered from Fort H. G. Wright to Washington Barracks for duty with Ambulance Company No. 2 in connection with the Cuban expedition.

Major Henry P. Birmingham, U.S.A., ordered from Fort McPherson to Newport News for duty as Brigade Surgeon in the Cuban expedition.

Captain W. N. Bispham, U.S.A., ordered to return to Fort Logan.

Passed Assistant Surgeon Rupert Blue, P.H.&M.H.S., appointed Sanitary Director of the Jamestown Exposition and placed in charge of the Public Health and Marine Hospital Service exhibit.

Passed Assistant Surgeon F. M. Bogan, U.S.N., ordered to the Washington Naval Hospital for treatment.

Medical Director John C. Boyd, U.S.N., ordered to command the Naval Medical School.

Captain Perry L. Boyer, U.S.A., returned to Fort Sam Houston from leave.

Surgeon W. C. Braisted, U.S.N., ordered from the Naval Medical School to duty as Assistant to the Bureau of Medicine and Surgery.

Dr. Frederick D. Branch, U.S.A., ordered from Fort Wood to Fort Totten for temporary duty.

Assistant Surgeon F. H. Brooks, U.S.N., granted six weeks sick leave upon discharge from the Newport Naval Hospital.

Captain William H. Brooks, U.S.A., ordered from Fort Washington to Washington Barracks for duty with Field Hospital No. 2 organizing for the Cuban expedition.

Dr. I. C. Brown, U.S.A., arrived at Fort McIntosh from sick leave.

Dr. Raymond W. Bryan, U.S.A., ordered from St. Louis, Mo., to the Army Medical School for instruction.

Captain C. D. Buck, U.S.A., ordered from Fort Leavenworth to the Presidio General Hospital.

Dr. John L. Burkhart, U.S.A., ordered from Chicago to Fort Sheridan.

Major Edward C. Carter, U.S.A., returned to Fort Leavenworth from leave.

Major William F. Carter, U.S.A., granted two months leave.

Acting Assistant Surgeon D. H. Casto, U.S.N., appointed October 6, 1906.

Dr. Alpha M. Chase, U.S.A., ordered from Fort Clark to Fort Sam Houston for temporary duty.

Captain Walter C. Chidester, U.S.A., granted leave until January 15, 1907, at which date his resignation is accepted.

Dr. Arthur C. Christie, U.S.A., ordered from Clymer, N. Y., to the Army Medical School for instruction.

Captain James R. Church, U.S.A., ordered from Fort Robinson to Newport News for duty with Field Hospital No. 10 in the Cuban expedition.

Major Joseph T. Clark, U.S.A., ordered from Fort Ethan Allen to accompany the 15th Cavalry on the Cuban expedition.

Passed Assistant Surgeon G. M. Corput, P.H.&M.H.S., ordered from New Orleans to Galveston.

Lieutenant Harold W. Cowper, U.S.A., ordered to accompany the 5th Infantry from Plattsburgh Barracks on the Cuban expedition.

Captain Walter Cox, U.S.A., granted two months extension of leave.

Captain George H. Crabtree, U.S.A., granted six weeks leave from Ancon.

Lieutenant Colonel William B. Davis, U.S.A., granted one month's leave.

Lieutenant William T. Davis, U.S.A., assigned to duty with Ambulance Company No. 2 in connection with the Cuban expedition.

Dr. G. W. Daywalt, U.S.A., returned to Fort De Soto from leave.

Passed Assistant Surgeon F. W. S. Dean, U.S.N., commissioned to date from January 26, 1906.

Passed Assistant Surgeon J. P. De Bruler, U.S.N., commissioned to date from January 3, 1906; ordered from the Washington Navy Yard to temporary duty in the Bureau of Medicine and Surgery; and to the Naval Medical School Hospital.

Captain M. A. DeLaney, U.S.A., returned to Washington, D. C., from leave.

Medical Director E. Z. Derr, U.S.N., promoted from Medical Inspector September 6, 1906.

Acting Assistant Surgeon M. Donelson, U.S.N., appointed October 6, 1906.

Medical Inspector W. R. Du Bose, U.S.N., ordered from the Navy Department to command the Yokohama Naval Hospital.

Dr. Charles T. Dulin, U.S.A., ordered from North Yakima, Wash., to Whipple Barracks.

Captain W. F. Duval, U.S.A., ordered from Fort Snelling to accompany the 28th Infantry on the Cuban expedition.

Lieutenant William R. Eastman, U.S.A., returned to the Presidio General Hospital from leave.

Assistant Surgeon H. G. Ebert, P.H.&M.H.S., ordered from the Revenue Cutter *Perry* to Seattle, Wash.

Surgeon S. G. Evans, U.S.N., ordered from the *Louisiana*, relieved from treatment at the Boston Naval Hospital and granted two months sick leave.

Captain Powell C. Fauntleroy, U.S.A., ordered from Fort Porter to Plattsburg Barracks for duty with the 5th Infantry in the Cuban expedition.

Dr. Robert L. Felts, U.S.A., granted three months leave from Fort Sam Houston.

Dr. J. B. Ferguson, U.S.A., returned to the transport *Dix* from leave.

Surgeon J. G. Field, U.S.N., assigned to duty at the Washington Marine Barracks.

Captain Clyde S. Ford, U.S.A., ordered to report to the Military Secretary in Washington for instructions in the matter of the personal identification record, and order for Philippine service suspended.

Passed Assistant Surgeon G. F. Freeman, U.S.N., ordered to the Portsmouth Naval Hospital.

Major Euclid B. Frick, U.S.A., ordered from Fort Snelling to command Field Hospital No. 10 and report to the Commanding General of the Cuban expedition at Newport News.

Dr. Leon C. Garcia, U.S.A., ordered from St. Louis to Fort Riley.

Passed Assistant Surgeon C. H. Gardner, P.H.&M.H.S., ordered from Galveston to San Francisco.

Captain Edward F. Geddings, U.S.A., ordered from the Presidio Gen-

eral Hospital to Newport News for duty in the office of the Chief Surgeon of the Cuban expedition.

Captain Henry L. Gilchrist, U.S.A., ordered to command of Ambulance Company, No. 2, and ordered to report to the Commanding Officer of Field Hospital No. 2 for duty in connection with the Cuban expedition.

Colonel Joseph B. Girard, U.S.A., relieved from duty as Chief Surgeon in the Philippines and ordered to the United States.

Dr. Bernard S. Gostin, U.S.A., ordered from Macon, Ga., to the Army Medical School for instruction.

Passed Assistant Surgeon J. H. Halloway, U.S.N., ordered to the *Nevada*.

Lieutenant Haywood S. Hansell, U.S.A., ordered from the Presidio of San Francisco with Ambulance Company No. 10 to Newport News for duty with the Cuban expedition.

Captain Frederick M. Hartsock, U.S.A., ordered from New York City to Washington Barracks for duty with Field Hospital No. 2 organizing for the Cuban expedition.

Colonel Philip F. Harvey, U.S.A., returned to Governor's Island from leave.

Dr. Hermon E. Hasseltine, U.S.A., ordered from Bristol, Vt., to Fort Thomas.

Dr. John R. Hereford, U.S.A., ordered from Fort Caswell to Fort Screven.

Assistant Surgeon Robert A. Herring, P.H.&M.H.S., appointed October 1, 1906, and ordered to New Orleans.

Captain J. D. Heysinger, U.S.A., ordered from San Francisco to report to the Surgeon General in Washington.

Passed Assistant Surgeon W. C. Hobdy, P.H.&M.H.S., ordered to represent the service at the semi-annual meeting of the California Public Health Association.

Colonel John Van R. Hoff, U.S.A., ordered from the camp of instruction at Fort Riley to Omaha; from the Headquarters, Department of the Missouri, to the Philippine Islands for duty as Chief Surgeon; and granted one month's leave.

Dr. David D. Hogan, U.S.A., ordered from Fort Hamilton to Fort Schuyler.

Dr. Michael E. Hughes, U.S.A., granted four months leave.

Dr. T. O. Hutson, U.S.A., returned to Fort McPherson from temporary duty at Fort Moultrie.

Dr. Arthur R. Jarrett, U.S.A., ordered from Brooklyn, N.Y., to Fort Totten.

Dr. Howard H. Johnson, U.S.A., ordered from Washington Barracks to the Army Medical School for instruction.

Major Richard W. Johnson, U.S.A., ordered from Fort Crook to Havana, Cuba, for duty as Medical Supply Officer of the Cuban expedition.

Lieutenant Harold W. Jones, U.S.A., ordered to accompany the 14th Cavalry from Sequoia and General Grant National Parks to the Presidio of Monterey.

Major Charles F. Kieffer, U.S.A., ordered from Fort D. A. Russell to accompany the 11th Infantry on the Cuban expedition.

Dr. Edgar King, U.S.A., ordered from Van Buren, Ark., to the Army Medical School for instruction.

Captain R. M. Kirby-Smith, U.S.A., granted three months sick leave from the Presidio General Hospital, and two months extension.

Captain C. E. Koerper, U.S.A., one month's leave granted and revoked; and ordered from Washington Barracks to accompany the 11th Infantry on the Cuban expedition.

Passed Assistant Surgeon C. H. Lavinder, P.H.&M.H.S., ordered from temporary duty at Detroit to Stapleton, N. Y., and from Stapleton, N. Y. to Wilmington, N. C.

Surgeon C. D. Langhorne, U.S.N., ordered to the *Brooklyn*.

Captain W. F. Lewis, U.S.A., returned from Chicago to Fort Sheridan, ordered from Chicago, Ill., to Fort Snelling and ordered from Newport News to Fort Monroe for temporary duty.

Lieutenant William L. Little, U.S.A., ordered from Fort Sam Houston to Washington Barracks for duty with Field Hospital No. 2 organizing for the Cuban expedition.

Lieutenant Albert G. Love, U.S.A., ordered to accompany troops from the Yosemite National Park to the Presidio of San Francisco, there to report for temporary duty.

Medical Inspector P. A. Lovering, U.S.N., ordered from the Naval Medical School to command the Norfolk Naval Hospital.

Captain William J. L. Lyster, U.S.A., left Fort McIntosh on three months leave.

Passed Assistant Surgeon A. D. McLean, U.S.N., ordered from the naval recruiting station at Cincinnati to that at Detroit.

Dr. Fred S. Macy, U.S.A., ordered from Fort Adams to the Army Medical School for instruction.

Passed Assistant Surgeon J. D. Manchester, U.S.N., commissioned to date from June 10, 1906.

Captain Charles E. Marrow, U.S.A., ordered from Fort Monroe to accompany the 2nd Battalion of Engineers on the Cuban expedition.

Dr. Marion F. Marvin, U.S.A., ordered from Fort Mansfield to Fort H. G. Wright for temporary duty.

Dr. John N. Merrick, U.S.A., granted two months leave.

Lieutenant Edgar W. Miller, U.S.A., ordered from Fort Riley to accompany Co. B, Signal Corps, on the Cuban expedition.

Lieutenant Reuben B. Miller, U.S.A., ordered from Owen's Sound, Canada, to accompany the 17th Infantry on the Cuban expedition.

Surgeon A. M. Moore, U.S.N., retired, ordered to the Naval Recruiting Station, Memphis, Tenn.

Lieutenant Samuel J. Morris, U.S.A., ordered from Fort Schuyler to the transport *Sumner* for duty as transport surgeon.

Dr. William H. Myers, U.S.A., ordered from Washington Barracks to the Army Medical School for instruction.

Captain R. P. O'Connor, U.S.A., arrived at Fort Leavenworth.

Surgeon J. E. Page, U.S.N., ordered to the Norfolk Naval Hospital.

Captain Robert U. Patterson, U.S.A., ordered from the Presidio of San Francisco with Ambulance Co. No. 10 to Newport News for duty with the Cuban expedition.

Lieutenant O. W. Pinkston, U.S.A., ordered from temporary duty in the Department of California to duty as Surgeon of the transport *Sherman*.

Surgeon G. Pickrell, U.S.N., ordered to the Bureau of Medicine and Surgery for special duty.

Dr. Henry C. Pillsbury, U.S.A., ordered from Boston, Mass., to the Army Medical School for instruction.

Surgeon J. C. Pryor, U.S.N., detached from duty at Washington Marine Barracks to additional duty at the U.S. Naval Medical School Hospital.

Captain William W. Quinton, U.S.A., ordered from Fort McPherson to accompany the 17th Infantry on the Cuban expedition.

Major H. I. Raymond, U.S.A., ordered to accompany troops from Columbus Barracks to Fort Mackenzie.

Passed Assistant Surgeon W. H. Rennie, U.S.N., commissioned to date from May 25, 1906, and ordered from the *Lancaster* to the Pensacola Naval Hospital.

Dr. J. J. Repp, U.S.A., ordered to the Army General Hospital at Washington, D. C.

Captain Thomas L. Rhoads, U.S.A., ordered from the Military Academy to Fort Crook and return.

Lieutenant Robert L. Richards, U.S.A., ordered from Vancouver Barracks to accompany the 17th Battery, Field Artillery, on the Cuban expedition.

Dr. George H. Richardson, U.S.A., ordered from the Presidio of Monterey to Angel Island.

Dr. W. H. Richardson, U.S.A., ordered to Fort Monroe for temporary duty and from Fort Monroe to the camp of supplies at Newport News, Va.

Dr. Guy V. Rukke, U.S.A., ordered from Ann Arbor, Mich., to the Army Medical School for instruction.

Surgeon A. C. H. Russell, U.S.N., ordered to the Naval Medical School with additional duty as member of the Naval Medical Examining Board.

Dr J. S. Sanford, U.S.A., relieved from the Philippines and ordered to Fort Washington.

Captain Jay Ralph Shook, U.S.A., ordered from Fort Des Moines to accompany the 11th Cavalry on the Cuban expedition.

Assistant Surgeon Frieuch Simpson, P.H.&M.H.S., appointed October 1, 1906, and ordered to Baltimore.

Captain George A. Skinner, U.S.A., arrived at Fort Snelling.

Lieutenant Robert Smart, U.S.A., ordered from Fort Myer to accompany the 14th Cavalry on the Cuban expedition.

Captain Herbert M. Smith, U.S.A., promoted from Lieutenant, September 20, 1906.

Passed Assistant Surgeon H. A. Stansfield, P.H.&M.H.S., ordered from Baltimore to Havana.

Acting Assistant Surgeon J. G. Stanton, P.H.&M.H.S., granted one month's leave.

Lieutenant C. J. Stedman, U.S.A., ordered to return from Newport News to Fort Stevens, and granted one month's leave.

Captain John H. Stone, U.S.A., ordered from Key West Barracks to accompany the 11th Cavalry on the Cuban expedition.

Assistant Surgeon E. C. Taylor, U.S.N., ordered from the *Hancock* to the New York Naval Hospital.

Lieutenant William H. Tefft, U.S.A., ordered from Fort Snelling to accompany the 28th Infantry on the Cuban expedition.

Dr. W. T. Thackeray, late U.S.A., has been elected Surgeon of the Western Society of the Army of the Potomac.

Captain Henry D. Thomason, U.S.A., ordered from Whipple Barracks to Newport News for duty with Field Hospital No. 10 in the Cuban expedition.

Passed Assistant Surgeon H. M. Tolfree, U.S.N., ordered from the Norfolk Naval Hospital to the *Connecticut*.

Dr. Clarence A. Treuholtz, U.S.A., returned to Fort Bayard from temporary duty at Fort Wingate.

Captain Albert E. Truby, U.S.A., assigned to command of Ambulance Company No. 10, and ordered to proceed with that organization from the Presidio of San Francisco to Newport News, reporting to the Commanding officer of Field Hospital No. 10 for duty with the Cuban expedition.

Captain Willard F. Truby, U.S.A., ordered from Fort Niagara to Washington Barracks for duty with Field Hospital No. 2. organizing for the Cuban expedition.

Dr. George T. Tyler, U.S.A., ordered from Baltimore to Fort Monroe.

Dr. H. H. Van Kirk, U.S.A., returned to Fort Sill from leave.

Passed Assistant Surgeon W. W. Verner, U.S.N., commissioned to date from May 25, 1906.

Captain S. H. Wadhams, U.S.A., ordered to accompany troops from Fort Slocum to Fort Mackenzie,

Major William J. Wakeman, U.S.A., granted one month's sick leave, and four months extension.

Passed Assistant Surgeon U. R. Webb, U.S.N., ordered from the Portsmouth Naval Hospital to the *Brooklyn*.

Captain Walter D. Webb, U.S.A., ordered from Fort Huachuca to Newport News for duty with Field Hospital No. 10 in the Cuban expedition.

Captain Henry A. Webber, U.S.A., ordered from Fort Banks to accompany the 27th Infantry on the Cuban expedition.

Surgeon A. B. Wentworth, U.S.N., ordered from the *Franklin* to the *Louisiana*.

Captain Clement C. Whitcomb, U.S.A., ordered from Fort McKinley to accompany the 15th Cavalry on the Cuban expedition.

Passed Assistant Surgeon H. W. Wickes, P.H.&M.H.S., ordered from Reedy Island Quarantine Station to Stapleton, N. Y.

Major Charles Willcox, U.S.A., ordered from Fort Totten to Washington Barracks for the purpose of organizing and commanding Field Hospital No. 2 for service with the Cuban expedition.

Lieutenant Compton Wilson, U.S.A., ordered from Fort Sheridan to accompany the 27th Infantry on the Cuban expedition.

Major Charles E. Woodruff, U.S.A., returned to Plattsburgh Barracks from leave.

Passed Assistant Surgeon J. S. Woodward, U.S.N., commissioned to date from June 10, 1906, and ordered to the Cincinnati naval recruiting station.

THE THIRD REGIMENT HOSPITAL CORPS, N.G.P.A., was highly praised by the regular army inspecting officers at the recent annual inspection, and was complimented by detail for the parade of the National Guard before the President at the time of the dedication of the new Pennsylvania state capitol.

MAINE ASSOCIATION OF MILITARY SURGEONS.—The Association of Military Surgeons of the State of Maine was organized at Augusta, August 16th, with the object of mutual improvement of its members in keeping them in touch with the medical departments of other states and with the regular establishments. Major Edwin M. Fuller was elected President; Colonel James B. O'Neil, Vice President; Lieutenant(j.g.) George H. Turner, Jr., Secretary and Treasurer, with an Executive Committee consisting of the President, Captain Gilbert M. Elliott and Captain J. Frederick Hill. Meetings are to be held semi-annually in midwinter and midsummer.

A MEDAL OF HONOR FOR MAJOR PAUL F. STRAUB.—At the White House on October 6th the President conferred a medal of honor upon Major Paul F. Straub of the Army Medical Department for gallantry in the face of the enemy. Major Straub, who was then Surgeon of the 36th Volunteer Infantry, at that time under the command of General J. Franklin Bell, U.S.A., voluntarily exposed himself to a hot fire from the enemy in repelling with pistol fire an insurgent attack at Alos, Province of Zambales, Island of Luzon, December 21, 1899, and at great risk of his own life went under fire to the rescue of a wounded officer and carried him to a place of safety. The medal of honor was recommended by General Bell at the time, but its formal presentation was delayed until the present month.

Current Literature.

WALTER REED AND YELLOW FEVER.*

THE world is fortunate in that so happy a record of so great an event in human progress, as is marked by the career of Walter Reed, has for its historian so accomplished an authority as the writer of this most interesting monograph. To the readers of the JOURNAL OF THE ASSOCIATION OF MILITARY SURGEONS the life of Major Reed, one of the Association's most honored members, contains much that is of interest and value, and the work of Dr. Kelly will doubtless find its way to the shelves of many of its members. The book, in addition to its value as a memorial of a great investigator, is of unique interest as a picture of the typical life of the Army medical officer, and as such, it must rank with the best type of sociological pictures. The great part of the book however is devoted to Dr. Reed's work in yellow fever, which is described fully and couched in language readily intelligible to the general public. In addition it is enriched by sketches and portraits of Drs. Carroll, Lazear, and Agramonte, Major Reed's associates on the Yellow Fever Commission, an excellent portrait of Dr. Charles J. Finley, the originator of the mosquito theory, and five portraits of Major Reed himself at different stages of his career. The book is dedicated "to James Carroll and to the memory of Jesse William Lazear."

LECTURES ON TROPICAL DISEASES.†

IN these days of medical compilation and persiflage a book of the originality, scientific accuracy and intensely interesting style of Sir Patrick Manson's Lectures on Tropical Diseases

***Walter Reed and Yellow Fever.** By HOWARD A. KELLY. 12mo; pp. 293, with numerous illustrations. New York, McClure, Phillips & Co., 1906.

†**Lectures on Tropical Diseases.** Being The Lane Lectures for 1905—Delivered at Cooper Medical College, San Francisco, U.S.A., By Sir PATRICK MANSON. Small 8vo; pp. 230, with 84 illustrations. Chicago, W. T. Keener & Co., 1905.

is a genuine pleasure. The more important tropical diseases are discussed with a clearness which shows first-hand knowledge and the life histories of the various animal parasites are treated in a pleasing style which does not detract from scientific accuracy. The suggestions regarding the problems in tropical medicine confronting America and the foundation of schools of tropical medicine in our large seaports deserve deep consideration. A valuable handbook for every physician coming in contact with tropical diseases.—W. C. RUCKER.

KELLY'S OPERATIVE GYNECOLOGY.*

THE author of this work is so well known, both as an operator and as an author and teacher, that it seems almost like carrying coals to Newcastle to refer to the high class of work which the new edition of his *Operative Gynecology* presents. The large edition published nine years ago was received with perhaps the greatest favor ever accorded to a work of the kind, and the extensive revision which the Second Edition manifests on nearly every page justifies a similar attitude upon the part of the profession toward the present issue. The revision has been so minute that a detailed account of it would almost involve the reprinting of the work itself, for there appears to be no respect in which the text has not been brought fully up to date.

RESEARCHES AT KHARTOUM.†

THE report of the Wellcome Research Laboratories at the Gordon Memorial College in Khartoum is an interesting and important contribution to tropical disease. Among the subjects treated are mosquito work in the Sudan, other biting and noxious insects, some blood-sucking diptera, human and animal pests and vegetal pests by F. V. Theobald, trypanosomiasis in the Sudan, and a considerable number of routine reports.

**Operative Gynecology*. By HOWARD A. KELLY, M.D. *Second Edition*. 8vo; 2 Volumes: pp. 680 and 656 respectively, with 1077 illustrations and 14 full page plates. New York and London, D. Appleton & Co., 1906.

†*Second Report of the Wellcome Research Laboratories at the Gordon Memorial College, Khartoum*. ANDREW BALFOUR, M.D., Director. 4to: pp. 255, with many illustrations. Khartoum, Department of Education, 1906.

INTERNATIONAL CLINICS.*

THE Third Volume of the Sixteenth Series of International Clinics presents the usual wide range of professional subjects. Among the interesting topics treated are recent modifications of Fournier's treatment of syphilis, accidental rashes in typhoid fever, tubal pregnancy, etc.

HUMAN PHYSIOLOGY.†

THE physiology of Tigerstedt has had an extensive vogue in the German and its appearance in English is a subject of congratulation to the American profession. The author approaches the subject in a logical and modern manner, taking up the physiology of the cell and the chemical composition, as a broad foundation in a most scientific manner. To this he adds in another chapter a full discussion of metabolism and nutrition which is particularly noteworthy because of its completeness. He then proceeds in a peculiarly lucid and logical manner to the further consideration of the individual components of the system, bringing out each point with high advantage and with much originality. The book is superbly illustrated and handsomely printed and may be regarded as a most valuable contribution to medical literature.

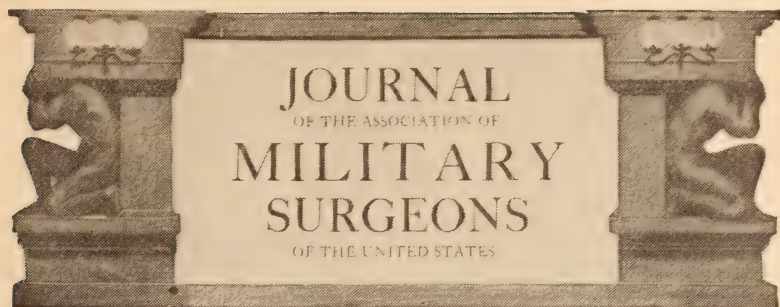
GYNECOLOGY, OBSTETRICS AND GENERAL
MEDICINE IN 1905-06.‡

THE fourth, fifth and sixth volumes of the Practical Medicine Series, covering the field of midwifery, diseases of women and general medicine, present an attractive form and a most available and readable text. The 12mo size of the books render them particularly convenient for the use of the busy practitioner and the succinct and concise style in which their contents is couched confirms their value.

**International Clinics*. Sixteenth Series, Vol. III. Edited by A. O. J. KELLY, M.D. 8vo; pp. 302. Philadelphia, J. B. Lippincott Co., 1906.

†*A Textbook of Human Physiology*. By Dr. ROBERT TIGERSTEDT. Translated and Edited by JOHN R. MURLIN, Ph. D. 8vo; pp. 752 with 305 illustrations. New York, D. Appleton & Co., 1906.

‡*Practical Medicine Series, 1906*. Vol. IV, *Gynecology*, Edited by EMILIUS C. DUDLEY, M.D. and C. VON BACHELLE, M.D.; Vol. V, *Obstetrics*, by JOSEPH B. DELEE, M.D.; Vol. VI, *General Medicine*, by FRANK BILLINGS, M.D. and J. H. SALISBURY, M.D. 12mo; pp. 360 each, with illustrations. Chicago, Year Book Publishers, 1906.



Original Memoirs.

AUTHORS ALONE ARE RESPONSIBLE FOR THE OPINIONS
EXPRESSED IN THEIR CONTRIBUTIONS.

THE TECHNIQUE OF A YELLOW FEVER CAMPAIGN.

By WILLIAM COLBY RUCKER, M.D.

ASSISTANT SURGEON IN THE UNITED STATES PUBLIC HEALTH
AND MARINE HOSPITAL SERVICE.



THE methods for the suppression of an epidemic of yellow fever are based entirely on the mosquito dogma. This reduced to basic principles now consists of three postulates:

1. Yellow fever is transmitted only by the *Stegomyia Calopus*.
2. This mosquito is infected only by biting a yellow fever patient in the first three days of the disease.
3. A mosquito so infected cannot transmit the infection until a period of from twelve to twenty days, usually fourteen, has elapsed.

Reasoning from these premises the fundamental objects of the campaign are:

1. Prevent the breeding of *Stegomyia*.

2. Locate all persons sick of yellow fever or suspicious fever as early as possible in the disease.
3. Prevent *Stegomyia* from biting them and becoming infected.
4. Destroy all infected *Stegomyia*.

Bearing these things in mind the first thing to do on taking charge of an epidemic is to plan to go about the doing of these things in a systematic and orderly manner. It is first necessary to establish a headquarters for the Commanding Officer and his Staff. This should be in a central location and should have ample telephone and telegraph connections. The office force is under the direct control of the Executive Officer and is divided as follows: Executive Division which has charge of the correspondence of the Commanding Officer, the preparation of orders and their issue and the receipt of the daily reports from the wards; the Division of Disbursements which receives all moneys and makes payments on payrolls and bills which have been previously visé by the Commanding and Executive Officers, and keeps the accounts; the Division of Statistics which receives all reports of positive or suspicious yellow fever from the wards or physicians and transmits all reports to Ward Commanders; traces all rumors of fever and furnishes the Commanding Officer with daily reports for the Press; the Purveying Division which purchases all supplies and issues them on requisition of the ward commanders; the Division of Train Inspection which issues all certificates of health, notes the names and addresses of all persons arriving in the city and transmits these to the ward headquarters in order that they may be kept under surveillance.

The city is divided into wards and an officer is placed in command of each. He first locates his headquarters in a central and easily accessible part of his ward, choosing if possible a building with a good storeroom and sets about hiring his office and field force. The size of these will vary with the size of the ward and the amount of infection therein. The following is an ample office force for a large and badly infected ward:

- 1 Superintendent who maintains a general supervision of the field work especially of fumigation.
- 1 Chief Clerk who attends to the correspondence, accounts, the files and the general office work, including the receipt and transmission of telephonic messages.
- 1 Clerk who keeps the card index of the sanitary survey and cases and files the records of fumigation and screening.
- 1 Store-keeper who receives and issues all supplies and generally keeps track of the "property."
- 1 Office-boy.

The medical part of the work can be done by one Officer and one or two medical assistants. For the latter young physicians are best. They are bright and keen and have the vitality necessary for the work.

The field force is usually secured without difficulty as an epidemic throws many men out of employment. Secure first men suitable for inspectors. Bright young clerks are best for this work. Contrary to my expectations I have found medical students totally unfit for such positions. For foremen in the field force men should be selected who have some experience in handling small bodies of men and at the same time have learned how to get on with the general public. Street car conductors and motormen are especially good. The workmen should be a little above the scale of intelligence of the average laborer but physically able to stand up to the work.

In the office all the clerical work is done in an orderly manner. Copies must be kept of all letters sent or received, of requisitions, receipts and reports, and a card index of the sanitary survey and the cases of positive or suspicious fever maintained. It is well to keep also a map of the ward in which different colored pins are placed each day to show the advance or recession of the epidemic.

The office must be furnished. This should be done very cheaply. Besides desks for the Commanding Officer and the office force there should be one set aside for foremen. Requisition should also be made for stationery, and blanks, and a typewriter rented.

As soon as Inspectors can be secured they should be placed at work on the sanitary survey of the Ward. This should be

done rapidly and thoroughly. The Ward should be divided into districts and detailed information regarding the number and street in which each house is located, the name of the house-

Inspector's Report.

Ward No.....Street No.....
 Number of persons living in premises.....
 How many sick since April 1st?.....
 What disease?.....
 What Physician attended?.....
 Is cistern oiled, and is it properly screened? If oiled, when was it oiled?
 What is condition of privy vault?.....
 Has it been oiled, and when?.....
 Any wells, pits or holes on premises, containing water?.....
 Any barrels, tubs, flower pots, cans or other receptacles containing water?
 Are there any gutters containing stagnant water?.....
 What is the general sanitary condition of premises? Give details, if not
 good

GENERAL REMARKS AND RECOMMENDATIONS.

(Under this head, if lot is empty, state whether there is any stagnant water on it).

Name of Inspector.....
 Date—New Orleans.....

holder, the number of rooms, the number of residents in the house, the number of cisterns, whether oiled or screened, the general sanitary condition of the premises and the occurrence of sick-

ness within the preceding two weeks, secured. The Inspector records this information on the foregoing blank which is copied in the office on to the following card for the card index.

.....Street.	Name.....
Persons in Premises.....	Sick since April 1st.....
Disease.....	Physician.....
Cistern Oiled.....	When.....Screened.....
Screening Repaired.....	Vault.....Oiled.....
When.....	Stagnant Water.....
Sanitary Condition Premises.....	
.....	
Warning Issued.....Affidavit Made.....	
.....	
Inspected	Re-inspected
Remarks:.....	
.....	

This gives the Ward Commander some data on which to work. While his inspectors have been collecting it he has been getting in his supplies for the prosecution of the remainder of the work. The following is a reasonable requisition for beginning the sanitary operations in a good sized ward:

5 bbls. kerosene oil	10 18" saws
5 spigots	5 box planes
5 4" tin funnels	15 gimlets
12 cistern oilers	24 10" screw drivers
12 one gal. oil cans	1000 lbs. sulphur
50 sail needles.	150 12" three-legged skillets
50 balls cotton twine	150 14" tin pans
50 bolts cheese cloth	5 bbls paste
1000 cistern sleeves	25 bundles old newspapers
1000 cistern springs	100 rolls 3" gummed paper
50 lbs. tacks	100 rolls ungummed
40 tack hammers	10 rolls 36" manilla paper
12 prs. shears	20 gals. alcohol (color this with
5 30' extension ladders	methyl-grün to keep the men from
10 shovels	drinking it).
75 screen doors	20 gals. aqua ammonia
10 bolts 108" bobbinet	250 lbs. copper sulphate

500 feet $\frac{1}{4}$ round strips	5 gross matches
500 feet $\frac{1}{2}$ round strips	5 12'x 25' tarpaulins
500 feet 3"x 1" strips.	5 garden spray tanks
10 boxes each 1 $\frac{1}{2}$ ", 1", $\frac{5}{8}$ " and $\frac{1}{2}$ "	20 lbs cotton batting
brads	24 paste brushes, 8"
10 lbs. each 4, 6, 8, 10d. nails	100 yds. Pepperell sheeting
100 door pulls	5 gals. linseed oil
75 prs. hinges	250 lbs. pyrethrum
100 spiral springs	100 lbs. carbolic acid
20 hammers	100 lbs. camphor
10 boxes each 1 $\frac{3}{4}$ ", 1", $\frac{3}{4}$ " and $\frac{1}{2}$ "	20 lengths perforated stove pipe
screws	5 doz. pencils with erasers

and such blanks, payrolls and other papers as may be designated by the Commanding Officer.

Then begins the first of the fundamental objects of the campaign, i. e., "prevent the breeding of *Stegomyia*." To accomplish this an understanding of the life history and habits of the *Stegomyia* is necessary. This insect is essentially a domestic mosquito and always breeds in and around human habitations. It oviposits by preference in fresh, clean, quiet water but when these are not at hand it has been known to breed in foul water. Its common breeding places are cisterns, rainwater barrels, tin cans, the broken bottles on the tops of walls, in the space above the chimneys of a barrel, the holy water fonts in the churches, fountains which contain no fish, the sag of a roof gutter, in cemetery urns, in water seals in idle plumbing, in horse troughs and in the cup formed by the junction of the leaves with the stem in certain plants of the agave family. It will breed anywhere in and around houses where there is fresh, clean, quiet water. This mosquito is sly and persistent in its attack, biting by preference just above the shoe tops. As in the other species of mosquitoes it is the female only which bites. The young mosquitoes, which are very voracious, bite in the daytime, but the adults, the ones which do the mischief, prefer to bite at night or in a darkened room.

First then attack this insect in its breeding places. Cisterns are the most important as they are the most numerous and on account of the quantity of fresh, clean, quiet water they contain,

form ideal breeding places. They must be screened. For this purpose organize screening and oiling squads. The unit of these is:

- 1 Foreman.
- 2 Workmen.
- 1 Wagon and driver.

Carpenters are best for this work. The wagon should be a covered delivery wagon drawn by a mule. The squad is supplied with the following stores:

1 bbl. oil	200 cistern sleeves
1 spigot	200 cistern springs
1 4" funnel	2 lbs. tacks
3 cistern oilers	4 tack hammers
4 1 gal. oil cans	2 pairs shears
6 sail needles	1 30' extension ladder
6 balls of twine	4 sacks dry sand
1 bolt cheese cloth	1 shovel

In the morning the foreman sees that he has this amount of supplies on his wagon before he starts to work. If he needs more he draws them from the storekeeper.

It would be better if the cisterns could be screened with eighteen or twenty mesh bronze wire netting but this is expensive and cheese cloth is generally substituted. The top of the cistern should be roofed with pine boards to prevent the cheese cloth from sagging and touching the water thus allowing little pools to form on the cloth. The cheese cloth should then be tightly stretched over the top of the cistern and about one foot down the sides. They should be frequently inspected and any rents in them repaired by means of a sail needle and a piece of twine. When the cheese cloth becomes rotten it should be replaced by a new one. The intake and outlet pipes must also be protected. The simplest way to do this is by inserting a footless white stocking with an internal spring which expands when released by the inserting hand. This holds the stocking firmly in place, allows the passage of water but does not permit the ingress or egress of mosquitoes. As a further precautionary measure a coating of kerosene oil one-eighth inch in thickness should be spread over the surface of the water. All other breeding places should be emptied, oiled or filled with sand. The municipality

in which the epidemic occurs should be urged to pass an ordinance requiring the proper screening with wire of all cisterns by the property owners.

The location of those sick of fevers, and in an epidemic of yellow fever all fevers must be considered suspicious, is not an easy matter. The more ignorant will hide their sick in the fear

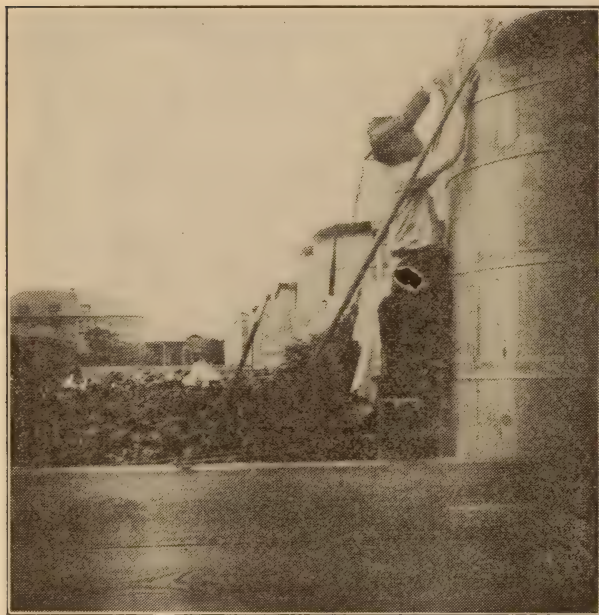


Fig. 1. A Row of Screened Cisterns.*

The man is oiling with a can. Note the pole beside him with the box on top. This is filled with oil which is spread upon the surface of the water by a spring on the edge of the box.

that they will be sent to the hospital and their places of business closed, while the better classes often act similarly to avoid fumigation of their premises and unpleasant notoriety. The people of the infected city must therefore be kept under constant surveillance. This need not be obtrusive or troublesome to house-

holders, the frequent inspection of their cisterns offering a good excuse to look over the house. The main support, however, is the family physician. He is required by law to report all suspicious or positive yellow fever cases and if treated with tact and courtesy he will be of the very greatest aid to the public health

*The photographs used in this paper were taken by Passed Assistant Surgeon C. H. Gardner, P.H. & M.H.S.

officials. If he is derelict in this duty he is soon found out and punished by imprisonment or fine.

Cases must be reported early. The patient is infective to mosquitoes during the first three days only, after which time he is absolutely non-infective and his discovery is of aid only in that it allows a final fumigation of the house. Inspectors must be reliable, tactful, observant and of good address.

Having discovered a positive or suspicious fever case, the patient must be kept in mosquito proof surroundings until the first three days have passed or until the case has been proven not yellow fever. To put it another way the mosquito must be protected from the patient. An eighteen or twenty mesh bobbinet bar must be hung about the patient's bed and the room carefully screened. The unit of the screening squad is:

- 1 Foreman.
- 2 Workmen.
- 1 Wagon and driver.

Carpenters are the best for this work. The squad should be supplied with:

3 screen doors	1 doz. spring hinges
1 bolt 108" bobbinet	6 spiral springs
75 $\frac{1}{4}$ round strips	4 hammers
75 $\frac{1}{2}$ round strips	1 box each $1\frac{3}{4}$ ", 1", $\frac{3}{4}$ ", $\frac{1}{2}$ " screws
75 3"x 1" strips	2 18" saws
1 box each $1\frac{1}{2}$ ", 1", $\frac{5}{8}$ ", $\frac{1}{2}$ " brads	1 box plane
$\frac{1}{2}$ lb. each 4, 6, 8, 10d nails	3 gimlets
3 lbs. tacks	2 pairs shears
6 door pulls	4 screw drivers

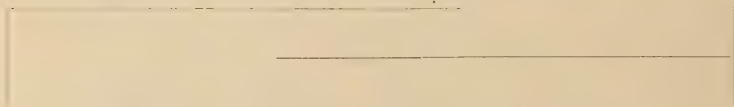
As soon as a case of yellow fever or suspicious fever is discovered by the Ward forces it should be reported to the Division of Statistics. On the other hand the Division of Statistics reports to the Ward headquarters cases which they have received knowledge of from outside sources. As soon as the Ward is cognizant of a case of yellow fever or suspicious fever the following card is made out and handed to the foreman of a screening squad, who proceeds immediately to the house of the patient and screens the sick room. It is best to choose for the sick room one through which there will be little if any passing by the people of the

house and in such a location as not to interfere in any way with the primary fumigation of the premises. As the patient is very sick at this stage of the disease, this work must be done as noise-

Report on Bar Supply and Screening.

Street..... No.....
 between.....and.....
 Name.....Physician.....
 Character of case } Suspicious of Yellow Fever.....
 } Yellow Fever.....
 Bars supplied..... Screened } Windows.....
 } Doors.....
 Still to be screened..... Hour Started..... } A. M.
 Hour Returned..... } P. M.
 Date.....1905.
 Signed.....Crew.
 Make Remarks on back of card; at top.

lessly as possible lest it annoy and excite him. Nails must be driven with muffled hammers and gimlets and screws substituted for them whenever feasible. The windows are best screened with bobbinet held in place by half round strips. If the window has outside blinds the bottom of the screening should be left somewhat baggy in order to allow the closure of the blinds from within the room. If it is found that the screen doors are too large for the doorway it is desired to screen, they should be cut down. If they are too small, a strip should be nailed in place for a door jamb. If the supply of screen doors runs out, bobbinet



Sectional View of Arrangement of Bobbinet from Above.

may be substituted for them as shown in the accompanying diagram. The bobbinet is nailed fast top and bottom with half round strips. The different layers will hang close together when

the "door" is not in use. Transoms are treated the same way as windows. If the room has a large door like a double door or an arched opening into another room, a door frame may be built of 3"x 1" material and the openings around this closed with bobbinet. In every case the door should be made to fit tightly into a border of quarter round material. This is necessitated by the fact that the doors are very liable to warp. The door should be provided with a hook and eye on each side. A strong spiral spring should be run from the inner side of the door jamb to the outer side of the door and the following card tacked to the door.

WARNING.

This screen door must not be left open a minute for any reason whatever. If this screen door is found broken or propped open or the netting of the doors or windows torn or cut, it will be sufficient cause to remove the patient to the Emergency Hospital.

AVVISO.

Questa porte di rete devono tenersi sempre chiusi e mai aprirli per nessuna ragione. Se per caso una di queste porte si trovera aperta, o rotta, o la rete stracciata, positivamente l'ammalato sara trasportato all'ospedale di Emergenza.

Other places through which a mosquito might enter a room e. g., flue holes, fireplaces and ventilator shafts should also be screened.

As soon as the foreman reports that he has screened the room the work is inspected by a Medical Officer or one of his assistants and the information called for on the following card secured. This forms a part of the card index system of the office and is used in keeping track of the cases and in furnishing information regarding them for the Division of Statistics in the General Headquarters.

Next begins the primary fumigation. This may be divided into two parts, first that of the screened room in which the

1. Name.....Date.....1905.
2. Address.....
3. NationalityColor.....Age.....
4. Physician.....
5. Where has he been in the last week
6. When taken sick
7. Where taken sick.....
8. When was case investigated.....
9. By whom was case investigated.....
10. When was room screened.....
11. By whom screened.....
12. When was house fumigated.....
13. By whom fumigated.....
14. When was first case in house.....
15. When was next case in house.....
16. How and when terminated.....
17. Remarks.....

patient is to be kept and secondly the remainder of the premises.
The unit of the fumigating squads is:

- 1 Foreman.
- 5 Workmen.
- 1 Wagon and driver.

Each squad is furnished with the following supplies:

- | | |
|--|--|
| 2 sacks sulphur (if in flowers, 200 lbs. if in roll) | 20 lbs copper sulphate or saturated solution of same |
| 40 12" iron pots | 1 12'x 25' tarpaulin |
| 40 14" tin pans | 1 garden spray tank |
| $\frac{1}{2}$ barrel paste | 1 4" tin funnel |
| 3 bundles old newspapers | 2 lbs. cotton batten |
| 10 rolls 3" gummed paper | 6 paste brushes with handles |
| 10 rolls 3" ungummed paper | 25 yds. pepperell sheeting, 1 yd. wide |
| 10 rolls 6" ungummed paper | 4 hammers |
| 1 roll 36" manilla paper | 4 screw drivers |
| 10 boxes matches | 5 gallons camphor-phenol |
| 2 gals. alcohol | 20 lengths perforated stovepipe |
| 2 gals. aqua ammonia | 20 6" tin pans. |

Each foreman should be given a copy of the following instructions:

INSTRUCTIONS TO FOREMEN.

Foremen only shall ask permission to fumigate. In case of refusal, report to superior in the field or telephone headquarters. Laborers are not to adjust difficulties. All such are to be referred to the foreman, who alone is empowered to discuss such matters with the householder.

Foremen shall see that their wagons are fully equipped before leaving headquarters, and that special pots for sulphur and pyrethrum, to be used exclusively for each, are provided. As soon as possible after arrival at the house, foremen will make an estimate of materials needed. These should be removed from the wagon in the least possible time, thereby making it possible to dispatch the wagon to another place on short notice, should it be needed.

Foremen shall either leave in charge or send back a man to open the house on the completion of the fumigation and will be responsible for the man so left. The man left in charge of the house to be opened after the wagon has left the field shall take a memorandum of the material left in the yard, which must be collected as early as possible the next morning.

Foremen must keep track of the overtime of their squad. Foremen will leave a man in charge to stop leaks at all primary fumigations. If your report has not been taken up at 4 o'clock p. m. phone headquarters the number of houses and rooms fumigated.

Approved,

.....Surgeon, Commanding.....Ward.

Fumigate first the room in which it is intended that the patient shall be kept during his illness, being careful to keep him under a bed-bar in another room until he is able to be taken into the fumigated room. After fumigation this room should be thoroughly aired and sprinkled with aqua ammonia and the patient transferred. The remainder of the house is then to be fumigated.

All openings are to be closed with paper and paste excepting those which are too large to be closed in this manner. For these latter tarpaulins or "Pepperell" sheeting covered with a thin coat of paint or having papers pasted thereon are most excellent. Another way is to have frames of 3"x 1" about 3'x 6' covered with sheeting and then papered. These can be easily slipped into place where needed and a strip of paper pasted around their edges. In the fumigation of sheds and outbuildings and similar more or less open buildings it will be frequently necessary to construct almost a new house out of paper. For this purpose 36

inch manilla paper will be found invaluable. For sulphur pots, 12 inch three legged skillets are best. The same style of pot should be used for pyrethrum but pyrethrum should never be burned in pots which have been used for sulphur. Anhydrous sulphur dioxide is lethal to mosquitoes. The pots therefore should not be placed in water but in 14 inch pans containing dry sand. Before lighting sulphur or pyrethrum a conical depression extending from the center to the bottom should be made and 50

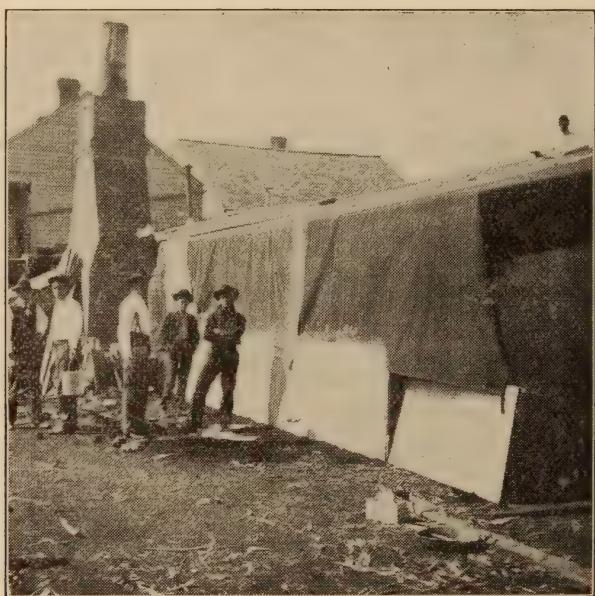


Fig. 2. Open sheds made smokeproof with tarpaulins and canvas covered frames.

cubic centimeters of alcohol poured in. Sulphur in the proportion of two pounds to the thousand cubic feet of initial air space is to be used where there is no bright metal work, paintings or tapestries to be injured. Pyrethrum in the proportion of three pounds to the thousand cubic feet or camphor-phenol, six ounces to the same area, is to be used elsewhere. In each instance the length of exposure is to be two hours. Pyrethrum is burned as

is sulphur. Camphor-phenol is placed in small tin pans on top of a piece of perforated stove pipe having a lighted alcohol lamp at the bottom. This precaution is necessary as the fumes are highly inflammable. It must also be remembered that camphor-phenol is toxic to human beings and great care is to be taken in entering the room before it has been thoroughly aired.

Following the fumigation of the infected premises contiguous buildings should be fumigated, contiguous being used in

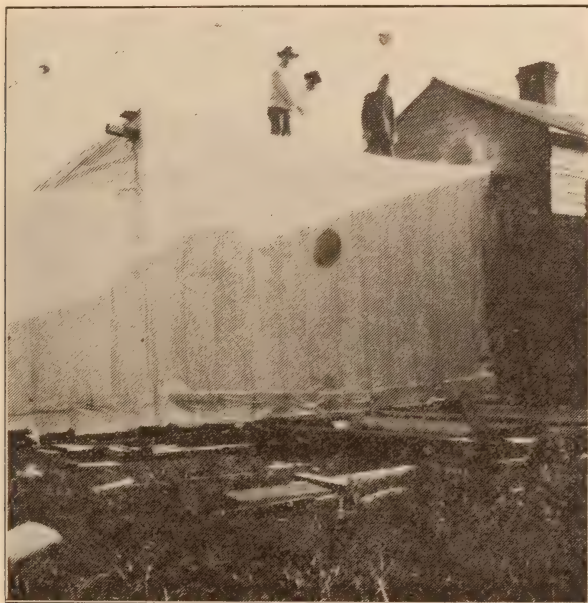


Fig. 3. A shed closed with canvas and paper.
The men on the roof are stopping leaks.

the sense of contiguity from the mosquito view-point, i. e., the places which are suitable for oviposition. In those areas which are badly infected or where premises are so closely connected as to be practically one continuous building, it is sometimes found necessary to do block fumigation. For this purpose a gang is placed on each face of the block and an attempt made to "fire" all the houses in the block simultaneously. In many places pools

of water will be found under the houses. Whenever it is possible salt is to be placed in these, but if as is very often the case, they are not accessible, a saturated solution of copper sulphate is to be thrown into them by means of a garden spray pump. Occupants of infected houses may remove any of their effects from the building before fumigation begins destruction of infected or infectible mosquitoes not of bacteria being the desired result. In

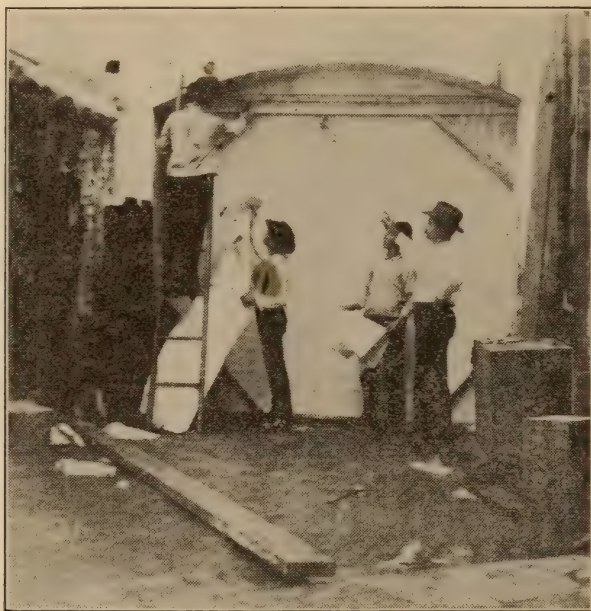


Fig. 4. Closing a large opening into an open court.
A frame covered with Pepperell sheeting is used. The men are pasting paper around the edges.

houses containing fine woodwork cotton batten may be chinked in and around doors and transoms to avoid injury to the woodwork. Windows when fairly tight may be closed by means of small wedges of wood which are driven between the frame and the casing. As soon as the patient recovers or dies the place is given a secondary fumigation. Contiguous premises are not refumigated at this time. Secondary fumigation should be done

before allowing a funeral or a wake on infected premises. Infected houses must be kept under surveillance from the 15th to 30th day after the discovery of the disease, to watch for secondary cases.

In no case should officers or their assistants treat or give any advice regarding the treatment of cases. This is the province of the family physician. All physicians must be treated with courtesy and tact. If no physician is in attendance, the relatives of

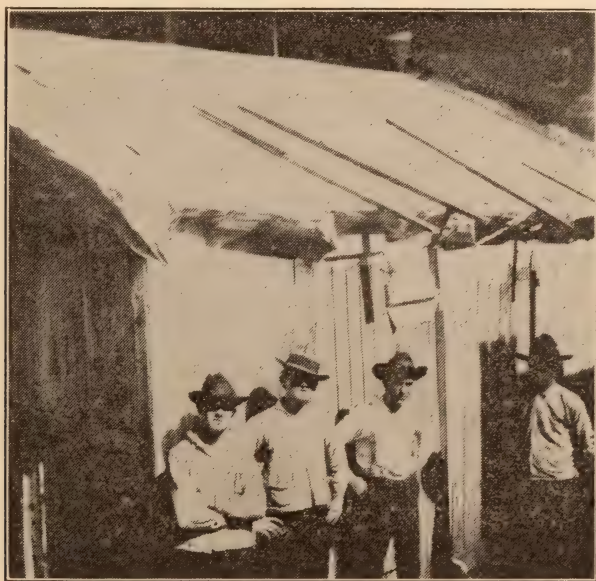


Fig. 5. An entire roof covered with manilla paper.

the patient must be informed that they must secure a physician or send the patient to the Emergency Hospital. The rule to be followed regarding fumigation and other sanitary measures in and around infected premises is "the patient belongs to his physician but the house belongs to the sanitary officers."

Many will attempt to escape fumigation by leaving or locking up their houses. Such places should then be sealed. The following has been found very efficacious.

SEALED!

BY THE
**United States Public Health and
Marine Hospital Service
AND
The City Board of Health
OF NEW ORLEANS.**
**OWNER, AGENT AND OCCUPANT.
ABSENT.**

**This Seal must not be broken without permis-
sion from the Headquarters of the U. S.
Public Health and Marine Hospital Ser-
vice in this ward.**
Address

In case fumigation is strenuously resisted the local police should be called upon to quarantine the house.

Sometimes rooms may be fumigated and closed until the end of the epidemic. In such a case this seal may be used.

**If this Seal is not
Broken the Room will not
REQUIRE further Fumi-
gation.**

Under normal conditions the *Stegomyia* does not breed in foul water but it must be remembered that by screening the cisterns and filling her other natural breeding places an unnatural condition is being created for her. It is possible under these conditions that she may oviposit in gutters. These then should be salted with rock salt in the proportion of 500 pounds to the face of each block. For this purpose salting squads are necessary. Their unit is:

- 1 Foreman.
 - 4 Workmen.
 - 4 Wagons with drivers.
- Each wagon is supplied with two scoop shovels.

At the end of each day's work each foreman makes a written report to the Ward Commander of the work done by himself and his squad that day. This is compiled and transferred to the following report which is forwarded to the Commanding Officer.

Date _____
DAILY SUMMARY
 Ward No. _____

Premises inspected, number.....
 Rooms screened, number.....
 Rooms fumigated, number.....
 Number cases reported to Ward Head- }
 quarters for screening and fumigating }
 Cases (Yellow Fever and "Suspicious") }
 discovered and reported to Central Office }
 Total sick investigated
 Premises reinspected for Secondary Cases.....
 REMARKS:.....

.....
 Surgeon P. H. & M. H. S.

At the end of each week a comparison of the number of positive and suspicious cases compared with the previous week is placed under the head of remarks.

Other than their protection from mosquitoes, the sick are not in any way isolated after the primary fumigation of the premises. They may receive visitors as far as their physical condition will allow and public funerals are permitted after fumigation of the house. Business in infected towns may go on uninterruptedly



Fig. 6. Closing the Openings under a Gallery.

and with the exception of the closure of places of public congregation at night, there is little interference with life in the infected city. Freight may be shipped in and out without fear of transmittal of the infection. Citizens can aid most by screening their cisterns and ridding their premises of mosquito breeding places, and in raising funds for the prosecution of the sanitary work. They should not be encouraged to do their own fumiga-

tion as it is almost invariably improperly done and it gives a false sense of security.

Persons entering the town give their names and city addresses to the Division of Train Inspection which in turn notifies the Commanders of the Ward in which they are to live. They are inspected each day for five days after their arrival. Persons leaving the city should be required to obtain a health certificate from the Division of Train Inspection. At the close of the epi-



Fig. 7. The Papers and Sheeting Removed after closing the Openings under a Gallery.

demic all property should be placed in as good condition as possible and turned into the hands of some responsible custodian. Sulphur pots should be burned out and given a coat of plumbago or stove blacking to keep them from rusting. Materials which are saleable should be sold and the monies thus secured turned back into the epidemic fund.

Men who have served through the epidemic are deserving of some certificate as to their ability. A discharge is a good way

Public Health & Marine-Hospital Service
of the United States



To All Whom It May Concern

Know Ye, That L. R. R.

who has been employed in the 4th Ward of the City of New Orleans, from the 16 day of August 1905, to the 10 day of October 1905, is hereby Honorably Discharged from the Public Health and Marine-Hospital Service of the United States by reason of the close of the Yellow Fever Epidemic of 1905.

J. M. White

Surgeon, Commanding

Character

No objection to his reemployment is known to exist.

— Loyal and industrious. A good foreman and fumigator —

Assistant Surgeon,

Commanding 4th Ward.

to do this. It not only gives the man a recommendation on which to obtain work elsewhere but is useful in hiring men to

serve through another epidemic. At the close of the New Orleans campaign of 1905 the foregoing discharge was issued to men on the recommendation of their Ward Commander. I have since seen many of these discharges which were held by their owners as among their most valued possessions.

This paper of necessity considers only the prosecution of a yellow fever cam-

paign in a city as I have no experience in handling the work in the rural districts. The same principles apply, however, wherever the epidemic may be.



Fig. 8. Closing cracks with paste and paper strips.

DISCUSSION.

Colonel W. J. R. RAINSFORD, R.A.M.C.—As an Army surgeon, I have not heard a more interesting paper than this one. When it appears in the *JOURNAL*, it should be read by all of us, especially those of us liable to serve in tropical climates. In Bermuda, all of our water has been obtained from roofs of houses and are, therefore, nice breeding places. What applies to Bermuda applies to other cisterns, and where we have tanks the inlet pipes should be continued from the top to the bottom of the tank. In that way mosquitoes cannot escape. The outlet pipe should go to the bottom. Covering a tank with a film of kerosene prevents the aeration of the water and gives it an unpleasant flavor, whereas the long pipes allow aeration of the water freely.

Captain P. C. FAUNTLEROY, U.S.A.—Every military surgeon may at some time serve in tropical countries, and he is going to be confronted with the suppression of yellow fever. The outcome of the experience of the P.H.&M.H.S. at New Orleans last year, when the record of the world was

made in the suppression of yellow fever at least six weeks before frost appeared, was due entirely to the fact of our knowledge of the transmission by the mosquito which was eliminated, thus making it a world's record. In fumigation by sulphur dioxide for smallpox, cholera and plague, we use water around the pots containing the sulphur. For the killing of mosquitoes it is used dry. I think Colonel Rainsford is correct in saying that we should keep a copy of this paper as a handbook, because sometime we may need it badly.

LOSSES OF THE GERMAN MILITARY EXPEDITION IN SOUTHWESTERN AFRICA.

THE personnel of the German military expedition in Southwest Africa on the last day of June of the present year (N. Topalsky in the *Voyenno Medizinsky Journal*) consisted of 516 officers, 208 military officials (Beamte), and of 14,572 N.C.O. and enlisted men; total 16,296 men. This expeditionary corps consisted of two regiments of Cavalry of full fighting strength, seven battalions (twenty-four companies) of Infantry, two battery groups of telegraphers, one railroad battalion of three company formation, and all the other necessary staff and administrative service personnel, giving a maximum strength of this corps at 18,613 officers and men. During the two and a half years of military operations, beginning with December 1903, the loss sustained in killed, died of wounds and diseases, was 2,342 men (German colonists are also included in these figures). The military expedition proper lost, by death, 1,322 men; by wounded, 798; total 2,120 men. There were invalided home 1,010 men and approximately a like number remained under treatment with and near the Corps. *Gunshot Wound Casualties*: 591 men were killed outright, 765 wounded, total 1,365 men. *Of the killed*, 63 were officers, surgeons and military officials (Beamte), 102 N.C.O., and 426 enlisted personnel, total 591 men. *Of the wounded* were 88 officers, 148 N.C.O. and 529 enlisted men, total 765 men. Of the total number of wounded, forty men died of wounds received. Death from disease was 603 men. The ratio between killed and wounded is 591:765 or 1:1.29.—W. F. DENIEDMAN.

RECENT OBSERVATIONS ON PRACTICAL SANITATION
WITH MOBILIZED TROOPS IN THE FIELD
AND SEMI-PERMANENT CAMPS.

BY LIEUTENANT COLONEL LOUIS MERVIN MAUS,
DEPUTY SURGEON GENERAL IN THE UNITED STATES ARMY;
CHIEF SURGEON, AND

CAPTAIN WILLIAM J. L. LYSTER,

ASSISTANT SURGEON IN THE UNITED STATES ARMY;
CHIEF SANITARY INSPECTOR
AT THE CAMP OF INSTRUCTION NEAR AUSTIN, TEXAS.

WHEN the encampments for the maneuvers for the regular and state troops became definitely settled by the War Department, after the passage of the Appropriation Bill, the latter part of last June, the Commanding General of the Department of Texas, ordered his Chief Surgeon, Lieutenant Colonel L. M. Maus, Deputy Surgeon General, U. S. Army, to Austin, Texas, for inspection of the proposed site, which had been offered by the State of Texas, and to inaugurate such sanitary arrangements for the troops as were deemed necessary.

The encampment grounds, known as Camp Mabry, are located about four miles north of the city of Austin, and one mile east of the Colorado River. The camp site proper consists of a level plateau containing about forty acres of rich black loam, partially covered with a light growth of bunch grass. The camp grounds were entirely inadequate for the number of troops ordered there, and as a result regiments and independent organizations were crowded together. The central portion of the grounds was left for reviews and parade purposes, and its outer portion occupied by the troops. In considering the sanitation of the camp, the section of the country, season of the year and temperature should be borne in mind as prominent factors. The maximum and minimum temperature for the entire period, July

15th to August 31st, 1906, was 97.5°F and 69°F, while the mean temperature for the period was 83°F. The grounds became gummy and tenacious, owing to the character of the soil when wet. These grounds had been used for many years (about twenty) for the annual encampment of the state troops, and in view of the previous poor sanitary arrangements, and large sick reports, were not considered very favorable for an encampment of two or three months' duration. During previous encampments the human excreta had been disposed of by the pit system, and the kitchen garbage and slops more or less buried in ditches. The water supply which was to consist of water pumped from the muddy Colorado River, without filtration, was also looked upon with suspicion, and held more or less responsible by the state medical authorities, for the large percentage of intestinal disorders and typhoid cases, which had marked previous encampments. The state military authorities had acquired the use of 8,000 acres adjoining the camp site for maneuver purposes, and owing to the brief time before the troops were to begin their march to the encampment, it was decided to accept the site in spite of the unfavorable outlook for good sanitation and health of the troops.

TROOPS DESIGNATED TO PARTICIPATE IN THE MANEUVERS
NEAR AUSTIN, TEXAS.

Regular Troops: First United States Cavalry, 2d Squadron and Band, 5th United States Cavalry, 6th and 15th Batteries, United States Field Artillery, one company United States Signal Corps, 25th and 26th United States Infantry. Fifteen per centum of these organizations were left behind to guard the posts during the absence of the commands and for certain official reasons, the orders directing the 25th Infantry to participate were rescinded.

State Troops: First Squadron, 1st Texas Cavalry, one Troop New Mexico Cavalry, two Batteries Texas Field Artillery, 1st, 2d, 3rd and 4th Regiments of Texas Infantry, one Battalion of Arizona and Louisiana Infantry, each. The total strength of the regular troops was 1,624, and the state troops 1,478, making a grand total during the encampment of 3,102, independent of the civilian teamsters and other employes amounting to 97. The

United States troops were required to march a portion of the distance before reaching the encampment grounds; 150 miles being designated for infantry, and 250 miles for cavalry and artillery. The following is a summary of the itinerary of the regulars en route to the encampment.

ITINERARY OF MARCH OF REGULAR TROOPS TO THE CAMP, NEAR
AUSTIN, TEXAS, AND FIELD SANITATION EN ROUTE.

The routes of march for the troops participating, gave distances varying from 153 miles for infantry, to 250 for cavalry and artillery. Before leaving their respective posts the daily camping grounds were selected, so that the Medical Department had little to do with the selection of the camp sites. It may be as well to state that the routes over which the troops were to march, were well known to the military authorities in advance, so that the daily marching distances were regulated at points where supplies could be obtained.

The country traversed was rolling, slightly wooded and not densely populated, the scattered farms producing principally corn and cotton, besides stock. The surface was a black loam, difficult to travel in wet weather, for troops and wagons. Portions of the road were a light macadam, but very little of it was bad during the trip. Only three rainy days were experienced by most of the command. The weather during the march was unusually warm and the maximum temperature at noon several times reached 106°F. in the shade. The troops wore the khaki breeches, flannel shirts, the recent new marching shoes and the felt campaign hats. The infantry carried the complete field equipment on their persons and the cavalry on their horses according to regulations on the subject. This, of course afforded the shelter tent for the men while in camp. Officers were provided with wall tents which were transported in the company wagons.

In compliance with an order issued by the Department Commander on the recommendation of the Chief Surgeon, each battalion was provided with an extra escort wagon for a Forbes Sterilizer (Army type series 5,000) and five ordinary sized barrels for containing sterile water on the march. On reaching camp the

empty barrels were refilled with sterile water for the following day's march unless the supply at that point was regarded as beyond suspicion by the accompanying medical officer. The men's canteens were also filled before starting out in the morning and they were discouraged in the use of more than one canteen full during each march. The wagons and sterilizers were under the charge of the medical officer, and operated by a member of the Hospital Corps. The following letter on the subject may prove of interest:

HEADQUARTERS DEPARTMENT OF TEXAS,
Military Secretary's Office,
San Antonio, Texas,

June 29, 1906.

* * * * *

The following recommendation of the Chief Surgeon of the Department will be complied with:

"I have the honor to recommend that each of the battalions and squadrons ordered to march to the encampment at Austin from the various posts in the department be provided with one escort wagon, one Forbes Sterilizer and the necessary barrels (about 5) for containing water from camp to camp. Practically the only two sources of danger of contracting serious illness en route result from infected water and malarial mosquito poisoning. It will be more or less difficult to prevent the infection from mosquitoes in camps where they abound, but it is perfectly possible to prevent typhoid infection by the means suggested above. It is also recommended that these outfits be placed under the control of the medical officer in charge of each command. * *

[Signed] L. M. MAUS,

Lieutenant Colonel, Deputy Surgeon General, U.S. Army, Chief Surgeon.

By Command of BRIGADIER GENERAL McCASKEY:

WALTER L. FINLEY,

Major, Military Secretary.

All of the medical officers whose columns were provided with sterilizers were of the opinion that their use in the field was practicable. In case this sanitary measure be adopted in the future, it will become necessary to construct two sizes of tank wagon with sterilizer and attachments, one for small detachments, say a company or less, and one for a battalion. The smaller tank

wagon, of not more than seventy-five gallons' capacity, to be drawn by a single animal, the larger one of 200 gallons.

DISPOSAL OF EXCRETA AND REFUSE EN ROUTE.

On reaching camp the very first thing requiring urgent attention is the preparation of proper pits, with pole rests and screens for the disposal of the human excreta. Should this be neglected very shortly the camp grounds will become defiled, since the action of men's bowels are usually more energetic on marches and in camp life. If possible an officer with suitable detail and tools should be sent out in advance to locate camp sites and prepare pits and ditches for the disposal of fecal matter, kitchen garbage and slops. Before leaving camp both pits and ditches should be most carefully covered over.

GENERAL OUTLINE OF THE SANITARY ARRANGEMENTS FOR THE ENCAMPMENT.

In order to outline the general sanitary policy of the camp the following General Order was issued by the Commanding General on July 27th, the day on which it was formally opened:

HEADQUARTERS MANEUVER DIVISION, Camp of Instruction, Near Austin, Texas,

General Orders, }
No. 6. }

July 27, 1906.

Upon the recommendation of the Chief Surgeon of the Division the following is issued for the guidance of members of this command, who will strictly comply with its requirements:

I. All members of this command while in camp, will use the latrines provided for the reception of their excreta. The receptacle for urine, placed in each company street and marked by a red lantern, may be used for voiding urine at night. Toilet paper will be used in latrines. The use of newspaper, or other insoluble paper will not be permitted. Any one defecating or urinating within the confines of the encampment, except as provided for above, will be punished by a summary court.

II. The water supply furnished the camp will be frequently examined by the Chief Sanitary Inspector, and in case it be found unpotable, he will furnish each company or separate detachment sterilized water for drinking purposes. Commanding officers will see that their commands are provided with properly filled canteens before going into the field, and that the use of

drinking water during the maneuvers be restricted, as far as possible, to that pronounced wholesome by the medical officer accompanying each command.

III. Company or detachment commanders will see that their grounds are carefully policed daily and the company streets broom swept. Loose paper, and other combustible material will be deposited in dry garbage cans. Kitchen slops and garbage will also be carefully deposited in cans provided for that purpose and kept closed. The ordinary street sweepings, such as gravel, earth, etc., will be collected in piles for removal. The sides of tents will be raised daily in order to insure a free circulation of air, and during clement weather, all bedding and clothing exposed to the sun.

IV. A barrel of quick lime will be kept in each latrine closet and the necessary paddles for mixing. A private will be detailed from each regiment or organization using a separate latrine, who will be subject to the orders of the Chief Sanitary Inspector, and attend to the duties connected with the latrine as prescribed in General Orders, No. 170, A.G.O., 1899. He will report to the Chief Sanitary Inspector any person detected in defecating or urinating on the floors of the latrine closets or in any way violating the provisions of paragraph I. He will also see that no waste closet paper after use, is permitted to escape from the latrine closets on the grounds.

V. Troop, light artillery, ambulance company commanders and other officers in charge of animals, picket lines or corrals, are required to see that the grounds occupied by animals under their charge are daily policed and the manure removed twice daily.

VI. No person will be permitted to peddle within the grounds of the encampment soft drinks, such as lemonade, soda water, pops, etc., nor to compound in camp such drinks except with water approved by the Chief of the Sanitary Division.

VII. The health of troops in the field depends upon the careful observance of camp hygiene, which involves the proper disposal of human and animal excreta, kitchen garbage and slops, the purity of drinking water, food and its proper preparation, and personal and general cleanliness.

These matters are so well covered by the requirements of Regulations, and the Service Manuals that no further instructions are deemed necessary.

By Command of BRIGADIER GENERAL MCCASKEY:

MICHAEL J. LENIHAN,

Captain, 25th Infantry,
Adjutant General.

It will be noted that paragraph IX, General Orders, No. 3, Headquarters Maneuver Division, Camp of Instruction, near Austin, Texas, which will be quoted later, turned over the practical sanitation of the encampment to the Chief Sanitary Inspector, which is believed to be the first instance on record in our

Army, where these important duties were properly placed. About three weeks before the arrival of the troops the sanitary policy had been outlined by the medical officer selected as Chief Surgeon of the encampment by the Secretary of War, and the necessary equipment estimated for. Fifty regulation urine and latrine troughs as described in General Orders, No. 170, A.G.O., 1899, and two odorless excavators with pumps were asked for, also two water wagons, three regulation iron sanitary carts, 500 galvanized iron barrels, hand basins and galvanized iron wash tubs at the rate of twelve of the former and six of the latter for each company.

Captain William J. L. Lyster, Assistant Surgeon, U.S. Army, was detailed by the Chief Surgeon of the camp as Chief Sanitary Inspector of the camp and First Lieutenant Perry L. Boyer, Assistant Surgeon, U.S. Army, and Contract Surgeon Alpha M. Chase, U.S. Army, as Sanitary Inspectors. Lieutenant Boyer took charge of the disposition of kitchen garbage, slops, etc., and Contract Surgeon Chase the latrines. Captain Lyster took personal charge of the sterilizing plant and general supervision of the camp hygiene.

The Quartermaster's Department began at once the erection of suitable lumber latrine sheds, bath houses, and the city of Austin the piping of the water into the camp. Three latrine closets with twenty-one seats, and one bath house with twelve showers were provided for each battalion.

WATER SUPPLY IN THE CAMP NEAR AUSTIN.

The water furnished the camp was piped in from the filter beds in the Colorado River, which as its name indicates was discolored by a red sediment. A portion of the time the water was pumped directly from the river without undergoing filtration. As far as the appearance went, there was little difference in the water, whether filtered or not, it as a rule being muddy in color and heavy with sediment. An analysis from the Surgeon General's office indicated that the supply was not considered good.

Arrangements had been made in advance to install a battery of twenty Forbes sterilizers, which were believed to be sufficient

to provide enough drinking water for the command at its maximum strength. A shed of lumber with roof, was provided for the battery, forty-eight feet long, six feet high and eight feet wide, and the sterilizers arranged in a row two feet apart. Each sterilizer was attached to the water system by means of a stop-cock and rubber hose, so that as many as were required could be kept in operation. They could also be detached at will for cleaning or repairs. A metal trough was constructed in rear of the sterilizers into which the sterile water ran, and from thence into galvanized iron barrels, conveniently located for pumping into the water wagon. The entire plant and the distribution of the water was under the charge of the Medical Department. The detail consisted of one Sergeant of the Hospital Corps, eight privates, and the two water wagon drivers. Two water wagons were sent out at 7:00 a.m. daily under the charge of a member of the Hospital Corps, and all of the water barrels filled. This was repeated in the afternoon if found necessary. All of the troops had been provided with galvanized iron barrels, with covers, for receiving the water, which were placed on the line of the cooks' tents.

While the water received on the grounds from the mains was not actually condemned, the men instinctively preferred the sterile water which they always found free from sediment. The comparative scarcity of hydrants and the numerous points at which sterile water was to be found, made it easy to have it used almost exclusively for drinking purposes.

The output and labor of the plant were as follows:

Daily average number of gallons of water sterilized ...	1,820
Daily average number of sterilizers used.....	14.3
Daily average number of working hours.....	9.3
Daily average number of gallons of fuel oil used.....	10.5
Average hourly output of one sterilizer, gallons.....	13.66
Maximum output for one day, gallons.....	3,500
Minimum output for one day, gallons.....	550

Eight men were employed directly in the handling of the plant, four attending to the sterilizers, working in two shifts; the others pumped and accompanied the wagons when delivering.

Cleaning, repairing and filling consumed much time and labor, and consequently cut down the time of running and the output. The allowance of sterile water never fell below three quarts per capita per diem.

The carbonate of lime and sediment found in the water supply materially interfered, and frequently it became necessary to close the plant for several hours at a time, in order to clean out the tubes and restore the sterilizers to a working condition.

Two of the hot water tubes belonging to the sterilizers were cracked and rendered useless on account of the accumulation of scale in the lumen of the tubes. This could be avoided by constant inspection and cleaning when the closing of the tubes was detected. The output of the sterilizers varied; two taken at random produced sixty gallons in as many minutes, or thirty gallons per sterilizer each hour, while in other sterilizers not more than fifteen gallons per hour could be obtained. The frequent stops from various causes are taken into consideration in the computation of production.

It is gratifying to state that after six weeks' use of the sterilized water both on the march and during the encampment in which over 3,000 men were concerned, but one case of typhoid fever appeared and no cases of dysentery or camp diarrhea. The case of typhoid fever occurred in a soldier of the 5th Cavalry, who had repeatedly visited the city of Austin, during the encampment, and partaken of water from various sources. At the time of the encampment twenty-six cases of typhoid fever were undergoing treatment in that city.

DISPOSAL OF KITCHEN GARBAGE, SLOPS, DISH-WATER,
LAVATORY AND LAUNDRY WATER.

One of the most difficult problems in a semi-permanent camp is the proper disposition of kitchen garbage, slops and water generally used for washing dishes, pans, dish cloths, hands and faces and the men's clothing. While cans are usually provided for the collection of the garbage and slops proper, a quantity of greasy water is constantly being thrown on the ground around the kitchens and in the drains, which within a reasonable

time, pollutes the ground, causing disagreeable odors and the collection of flies, if the season be warm. Generally speaking the use of five galvanized iron barrels of thirty gallons each, was found necessary for each company for the collection of slops and garbage, for use as a urine tub, for containing drinking water and for the dry wastes collected about the company streets. Two of these barrels were located on whitewashed platforms in the immediate vicinity of the kitchen for slops and garbage, one for drinking water, one as a night urine tub, and one for dry wastes. The night urine tub after being emptied at reveille, could be rinsed out, limed and used for the collection of dry wastes. The kitchen garbage and slops were removed once or twice daily by means of the regulation iron sanitary carts, and were hauled one half mile from the camp grounds and fed to the hogs. In case hogs be not available, it should be hauled one mile to leeward of the camp, a drain provided for the fluid portion, and the solids burned by a fatigue party, from day to day, in an impromptu crematorium easily constructed of stone. The method of emptying and carting away the kitchen slops by means of the sanitary carts was not found satisfactory for the following reasons:

1. When filled the barrel is too heavy to lift and empty into the cart.

2. The system of bailing out a portion by means of buckets before emptying the barrel admits of drippings between the barrel and cart.

3. A portion of the fluid slops from the sanitary cart will invariably splash out over the company roads and streets during transit, especially if the ground be rough or stony.

It will be discovered within two or three weeks after the installation of the tent camp, unless the most scrupulous care be observed in the collection and disposal of kitchen slops, garbage, greasy and soapy waters, that the grounds around the kitchens will smell and attract large numbers of flies. In order to perfect a system for disposing of these wastes it is suggested that all kitchen and company fluids, except the urine, be removed by a special excavator wagon, arranged on the principle of the odor-

less excavator now employed for emptying latrine troughs. The system is feasible and it is believed if properly carried out, that the grounds around field kitchens could be kept sweet and clean indefinitely. In order to carry out this system a removable sieve will have to be employed in the galvanized iron barrels, and the cooks and assistants instructed to carefully empty all slops containing solids into them first. After draining, the solids are emptied into a separate barrel, which when filled, can be easily carted away by an ordinary escort wagon and burned, or be taken away by the sanitary cart without fear of contaminating the grounds over which it passes. Before return to the kitchen grounds, the galvanized iron barrels should be washed out and thoroughly cleaned, as well as the sanitary cart; otherwise they will be accompanied back to camp by swarms of flies. The fluid slops, after the solids have been removed, are easily drawn off by the slop excavator wagon without disturbing the barrels and hauled away to a safe distance, to the leeward of the camp.

Strict orders should be issued with penalties attached, in regard to emptying all water used for washing dishes or kitchen cloths, rinsing cooking vessels, boiling potatoes, etc., into the slop barrel, and the cooks and attendants frequently instructed as to its absolute necessity. In addition to the kitchen slops, there is another class of water, which if not collected and carried beyond the limits of the camp, without question, will breed trouble and pollute to a certain extent the company grounds. We refer to water used for lavatory and laundry purposes, which as a rule is emptied on the company grounds. A lavatory point should be selected at some convenient place in each company street, preferably near the water supply, and all the men required to proceed there for the purpose of washing their hands and faces. The soapy water should be collected in a barrel and carried to the bath house drain or removed by the slop excavator wagon. In no case should this soapy, dirty water be thrown on the company grounds, for unquestionably within a short period—several weeks—the resulting wet ground and scum will attract flies. Likewise a point outside the company grounds should be selected for laundry purposes, and the men be provided with troughs

and bench tables for washing their khaki and underclothing. In case troughs cannot be provided, each company should be supplied with six galvanized iron tubs for this purpose, two nests of three each. The laundry water should likewise be emptied into the bath house drain or taken away by the excavator slop wagon.

DISPOSAL OF HUMAN AND ANIMAL EXCRETA.

The human excreta of the camp was disposed of by means of the regulation urine and latrine troughs as prescribed in General Orders, No. 170, A.G.O., 1899. Rough pine lumber sheds, twenty-six feet long, ten feet high and eight feet wide were provided for the urine and latrine troughs, which were connected to the water system by an inch pipe for filling and flushing. Each latrine trough was boxed in and provided with seven seats. An illustration of these troughs may be seen in Munson's Hygiene. No covers were provided for the seats in latrines used at Camp Mabry and it is believed if the milk of lime emulsion and excreta be kept well mixed as intended, these will be unnecessary. It is recommended, however, that the latrine closets be screened as a precaution during hot weather, and especially if flies be prevalent. Very few flies were noticed in and around the latrines at Camp Mabry, even when they were quite plentiful elsewhere. It is believed that if the top containing seats was set on legs, just long enough to let it rest flush on the edge of the trough the boxing would prove unnecessary and the front of the trough could then be left open for inspection and cleaning. To prevent men from standing on the seats, as a few of the state troops did, who were not "house broken," a strand of barbed wire should be strung from posts at each end of the trough, so that men would be required to take the sitting posture. A beam of wood could also be so arranged to serve the same purpose.

The latrine sheds were whitewashed within and without, and the interior ground covered with fine gravel. Wooden floors would be better for encampments of more than eight weeks, and especially during the rainy season. A yellowish wash, the color of khaki, would be preferable on the outside of the shed during bright, sunny weather, as it would render them less conspicuous.

The cocks connected with the flushing pipes should be boxed in, to prevent meddlers from overfilling the trough at times, as was the case at Camp Mabry, and put under lock and key. The latrine attendant should keep one key and the chief of the excavator wagon the other. One attendant to three latrines was found ample, and one-sixth of a barrel of lime per day sufficient. The following circular was issued for use of latrine attendants:

HEADQUARTERS MANEUVER DIVISION,
Camp of Instruction,
Near Austin, Texas,

CIRCULAR.

July 31, 1906.

Upon recommendation of the Chief Surgeon of the Division, the following Rules and Regulations governing the use of urine and latrine troughs are published for the information and guidance of the Command:

By Command of BRIGADIER GENERAL MCCASKEY:

MICHAEL J. LENIHAN,
Captain, 25th Infantry,
Adjutant General.

RULES AND REGULATIONS.

1. The attendant in charge of latrines will visit them daily every hour from 6 a.m. until 10 a.m., and from 5 p.m. until 8 p.m. He will see that each latrine is properly provided with toilet paper, and that newspaper or other insoluble paper is not used in the latrines. Newspapers, bottles, bits of glass, pieces of sticks, and other solid material which may be collected in the troughs are destructive to the excavator pump, destroys and renders them unfit for use.

2. He will be present when the latrines are emptied, and immediately afterwards refill the troughs with water to the depth of 4 inches, adding one bucketful of lime, which must be thoroughly emulsified. During his hourly visits he will stir the contents of the trough thoroughly until the contents are well mixed and add additional lime when necessary.

3. He will also see that the contents of the urine tub provided for each company at night, are emptied into the latrine troughs before the contents of the latter are emptied by the odorless excavator.

4. He will also whitewash and re-whitewash when necessary, the latrines under his charge, police the grounds immediately around them, and see that the floors and seats are kept scrupulously neat and clean.

5. He will report to the Chief Sanitary Inspector the names of any one found violating the provisions of General Orders No. 6, Headquarters Maneuver Division, dated July 27th, 1906.

An excavator wagon required the services of four men as follows: one driver, one man to stir contents of trough during pumping out process and two men to work the pump. In case the animals are gentle, the driver could assist in pumping, thereby reducing the detail to three men. Eight latrines ordinarily filled, are sufficient to load one excavator wagon of 500 gallons' capacity, and with a fairly long haul, three-fourths of a mile, the entire process of filling, hauling, emptying and returning requires about three hours.

The factor in saving time and increasing the efficiency of both excavator wagons and sanitary carts is dependent for the most part directly upon good roads and short hauls. This point is important in laying out the camp and in estimating the number of wagons and carts necessary to accomplish a given piece of work. If the latrine is well cared for it is not necessary to place it more than fifteen yards from the tent at the end of the company street. Inspections and extra parts are required to avoid the temporary paralysis of the system resulting from a breakdown. The crew soon becomes proficient and very little if any spilling or slopping of the contents of the excavators occurs. One to a brigade is the allowance mentioned by Munson, but this is considered low, and where no other system is promptly available an extra wagon should be in reserve.

Definite and binding arrangements should be made as soon as the system is ordered installed, with the owners of property on the leeward of the camp, if no suitable ground on the reservation is available for emptying the excavators. It is disconcerting and might prove of great inconvenience, if objecting owners withdrew the permission to use their fields. If to the leeward as indicated by the prevailing winds of the season, 600 to 800 yards from any troops is ample distance for dumping ground. When emptying the wagon it should be driven to a portion of the field not used within the past few days, and moved while its contents are running out: this prevents puddling and better exposes the material to the sun and to any nitrifying elements in the earth over which it is spread. It was observed that when this method was used the ammoniacal and lime odor very promptly disap-

peared. The portions of the fields were soon marked by a luxuriant growth of grass.

In breaking camp the troughs, after having been emptied, were flushed with fresh water and lime, and scrubbed with brooms and then again pumped out; the entrances to the latrine were then boarded up and nailed.

In the neighborhood of communities care must be taken not to dump on the watershed intimately connected with the local water supply.

DISPOSAL OF SWEEPINGS FROM PICKET LINES.

The ground immediately about picket lines should be broom swept twice daily, the sweepings carted to a point to the leeward of the camp and burned. This necessitates in well planned camps but a short haul. Routes to point of burning should not traverse any more of the camp than possible as some of the load scatters along the way.

Farmers near the encampment desiring the fertilizer, frequently offer fields for the wagons to be dumped upon, thus saving the trouble of burning, but caution is to be shown in permitting this as it requires a longer haul, later, if the camp be infested with flies developing in such manure piles.

The tendency is for officers of mounted troops to use the topographical peculiarities as an excuse for crowding the picket line upon the troop tents. Neither this nor the extra guard required is a sufficient excuse for placing the picket line too near in semi-permanent camps.

PROPORTION OF LABORERS TO TROOPS REQUIRED FOR REMOVING FECAL MATTER AND KITCHEN GARBAGE.

- 11 men to 4,089 troops,
- 1 employe to 372 troops,
- 1 sanitary cart to 1,366 troops,
- 1 excavator wagon to 2,049 troops.

Urine Tub: A galvanized iron barrel marked with a red lantern was placed about the center of each company at 7:30 p.m. daily, for the reception of urine during the night and removed by the company police at reveille and emptied into the latrine

trough. The men were cautioned about the necessity of this measure and the infectious nature of urine from men affected with typhoid fever.

TENTAGE AND CLOTHING.

The troops as a rule were sheltered in the khaki colored conical wall tent in the proportion of six men to each tent, but they were supplied with the gold medal cot. In case the men lie on the ground a much larger number can be accommodated in each tent. Officers were supplied with the standard khaki colored wall tent. The conical wall tent is not adapted to a warm or tropical climate on account of its heated interior. This results from the low walls, small air space and reflection from the sun on the conical walls. From observation made frequently its interior is found to be from four to eight degrees hotter than the square tent under similar circumstances. It is recommended that the standard hospital tent be used for southern or tropical climates in place of the conical tent and that six men be limited to each tent. The clothing used by the men consisted of the felt campaign hat, woolen shirt, khaki uniform and the new marching shoe and legging. The hat as ordinarily worn is creased, which does not give sufficient air space around the head. A headgear suitable for summer wear in hot climates, should contain abundant air space above the cranium, with side and band ventilation, none of which qualities are possessed by the present felt hat. The new marching shoe was found satisfactory on hard or gravel roads and better than the light soled shoe previously worn. The new legging without the ankle portion is an improvement, but is hardly necessary with a high topped shoe. In fact with a properly designed breeches there is no need for the legging; the present khaki breeches are too tight over the knee for foot troops and tend to split at that point; they should be made after the style of a knickerbocker as used by bicyclists, with a cuff long enough to meet the shoe top, and loose at the knee to permit entire freedom in hill climbing. The olive drab and khaki flannel shirts were found admirable, and an improvement on the blue shirt for hot weather. With the neck open and the sleeves rolled up while marching a

considerable increase in evaporating surface and consequent cooling was afforded; this could be increased in hot weather by prolonging the slit in the sleeve at the wrist to the shoulder and providing several pairs of tapes sewed to each edge to unite the sleeve when desired.

Many of the troops had but two suits of khaki uniform issued them which is insufficient. Three suits at least should be allowed each man during the summer season in the South. Not infrequently after a few hours' "hike" during a hot day the entire suit becomes wet with perspiration and requires washing. If not washed after one or two thorough soakings with perspiration, the uniform becomes sour and unfit for wear.

MEDICAL SERVICE.

The following General Order gives an outline of the medical service relative to the care of the sick:

HEADQUARTERS MANEUVER DIVISION,

Camp of Instruction,
Near Austin, Texas,

General Orders, }
No. 3 }

July 27, 1906

Upon the recommendation of the Chief Surgeon of the Division the medical service during the encampment will be organized as follows:

I. FIELD HOSPITAL.

- 5 medical officers,
- 2 sergeants first class hospital corps,
- 4 sergeants hospital corps,
- 10 privates first class hospital corps,
- 11 privates hospital corps.

II. AMBULANCE COMPANY.

- 2 medical officers,
- 1 sergeant first class hospital corps,
- 2 sergeants hospital corps,
- 10 privates first class hospital corps,
- 15 privates hospital corps.

III. REGIMENTAL DISPENSARIES.

- 2 medical officers,
- 1 non-commissioned officer hospital corps,
- 1 private first class hospital corps,
- 1 private hospital corps.

IV. DISPENSARIES FOR SEPARATE BATTALIONS OR SQUADRONS.

- 1 medical officer,
- 1 non-commissioned officer hospital corps,
- 1 private first class or private hospital corps.

V. SANITARY DIVISION.

- 1 chief sanitary inspector,
- 2 sanitary inspectors,
- 3 non-commissioned officers hospital corps,
- 5 privates first class hospital corps,
- 8 privates hospital corps.

VI. SERVICE OF FIELD HOSPITAL. The sick of the entire command including State troops requiring hospital treatment will be sent to the field hospital. Serious cases which cannot be properly cared for in the field hospital will, upon the approval of the Chief Surgeon, be sent to a base hospital. The post hospital at Fort Sam Houston will be employed as a base hospital for the United States troops, and the Austin Infirmary for the State troops.

VII. SERVICE OF REGIMENTAL DISPENSARIES. Each regiment, separate battalion, or squadron will be provided with one hospital tent, one detachment chest, one medical field desk, two field cots and other necessary medical and surgical supplies. Surgeons attached to regiments or separate organizations will attend daily sick call, and transfer to the field hospital all cases requiring hospital treatment, with list of cases sent, attend those in quarters, prescribe for slight ailments of men not on sick report, make regular inspections of the camp, including the preparation of food, which will be made during each meal, and submit the necessary medical and surgical reports required by the Medical Department of the Army, and attend to the other clerical work.

VIII. SERVICE OF AMBULANCE COMPANY. The officer in command of the ambulance company will assign an ambulance to attend sick call at the dispensary of each regiment or separate organization, which will transfer the sick immediately after sick call to the field hospital. He will see that ambulances are kept in readiness to answer emergency calls at any hour of day or night. He will also provide the necessary ambulances properly equipped to accompany troops during the field maneuvers. Ambulance and litter drills will be under the supervision of the senior officer of the ambulance company.

IX. DUTIES OF THE SANITARY DIVISION. The Chief Sanitary Inspector will take charge of the practical sanitation of the camp. He will take charge of the odorless excavators and squads attached thereto and see that the urine and latrine troughs are properly managed and emptied. He will also take charge of the sanitary carts, wagons and squads attached

thereto, provided for the removal of kitchen garbage, slops and other refuse matter of the camp, and see that they are properly removed. He will take charge of the sterilizing plant and see that every company and detachment is provided with proper drinking water.

X. In order to facilitate the medical and sanitary administration of the camp all assignments of medical officers and members of the Hospital Corps detachment will be made by the Chief Surgeon, "By Order of the Commanding General of the Camp of Instruction."

By Command of BRIGADIER GENERAL McCASKEY:

MICHAEL J. LENIHAN,

Captain, 25 Infantry,

Adjutant General.

The system embodied in the above order was carried out, and except trivial cases all patients regular and state troops alike were treated in the Division Hospital. As far as could be learned there was no objection on the part of the patients of the state troops, or their medical officers, to the transfer to the Division Hospital. It will be noted that paragraph X of the above order clothed the Chief Surgeon of the encampment with complete autonomy of the personnel of the Medical Department and Hospital Corps Detachment. In the field with large bodies of troops, and especially during the active campaigning, or in large encampments, the success of medical administration depends upon this control. The state troops remained in camp from August 5th until August 22d and during this period the sickness amounted to less than two per centum of the command during that time, and was confined principally to sore feet and other slight ailments. No camp diseases proper, such as dysentery, diarrhea or typhoid fever occurred. Several cases of venereal diseases were treated, but the infection was brought with the troops. The percentage of sickness among the regular troops was less than that occurring among the state troops.

But one case of typhoid fever occurred among the regulars from the date of leaving their stations July 15th, until August 31st, and no cases of camp dysentery or diarrhea. Malarial fever was also conspicuous by its absence, and but few mosquitoes observed in camp. The soldier, who contracted the case of typhoid belonged to the 5th Cavalry and is supposed to have contracted

the infection outside of the camp limits, where the disease was more or less prevalent.

GENERAL CONCLUSIONS AND RECOMMENDATIONS.

1. That the use of sterilized water with troops on the march or in field is feasible, and that a special water tank wagon provided with a sterilizer, should become a part of the field equipment.

2. That soldiers should be discouraged from excessive water drinking while on the march during hot weather, it being a habit and not a necessity.

3. That kitchen and mess tents be screened in semi-permanent camps, and that the necessary amount of wire gauze become a part of the company field equipment. A portable tubular framing with screened sides and corrugated iron or canvas roof is suggested for use of kitchens and mess rooms in the field.

4. That companies be required to eat at a designated point in camp, and not permitted to carry their food and eat at random in the company street.

5. That a lavatory point be selected for each company in semi-permanent camps on the company grounds and the men required to wash there, and to empty the soapy water into a receptacle for removal.

6. That a point be selected outside of the company grounds for laundry purposes in semi-permanent camps, and the laundry water collected and removed.

7. That six galvanized iron barrels be issued as a part of the field equipment of each company, two for kitchen slops, one for drinking water, one for night urine tub, one for dirty lavatory water and one for laundry water. The urine tub after being emptied and cleaned out at reveille may be used to collect dry wastes in policing the camp.

8. That six galvanized iron tubs be issued as a part of the field equipment of the company for laundry purposes.

9. That kitchen fluid slops, hand and laundry water, be removed by an excavator wagon instead of the sanitary iron cart.

10. That the regulation latrine trough if properly attended and emptied is sanitary for semi-permanent camps during weather

above the freezing point. During cold weather the dry earth system should be employed.

11. That the latrine sheds be screened in semi-permanent camps.

12. That flies can be prevented to a great extent in camp by scrupulous cleanliness of camp grounds, especially around the kitchen, mess tents, latrines and picket lines.

13. That the present regulation felt hat is unsatisfactory for campaign purposes in a hot or tropical climate.

14. That the infantry marching trousers should be made fuller around the knee, and the cuff extended down the leg far enough to be enclosed by the top of the marching shoe, thus doing away with the legging.

15. That the conical wall tent is unsuitable for semi-permanent camps in hot or tropical climates.

16. That a command be allowed three days after arrival to place the camp in order, ditch tents, dig street drains, before going out on the maneuver.

17. That a sanitary service corps be authorized for camp sanitation under the control of the Medical Department.

18. That the practical sanitation of a field camp be made a part of the duties of the Medical Department and incorporated in Army Regulations.

THE DRY-DRESSING OF WOUNDS IN THE SOUTH-WEST-AFRICAN WAR.

THE many difficulties experienced by the surgeons in this war (Goldammer, Hamburg) were largely caused by the constant poor supply of water and the enormous distances from field to base, rendered more considerable through poor means of transport. Under these conditions, dry dressings proved most valuable. Goldammer lays particular stress upon a combination of complete and exact fixation, with sterile dry dressing in all injuries to bones.—*Annals of Surgery*.

SOME MEDICAL AND SANITARY QUESTIONS MET IN EVERY DAY LIFE ON A CRUISING SHIP OF THE NAVY.

By MANLY H. SIMONS, M.D.,

MEDICAL DIRECTOR IN THE UNITED STATES NAVY.

SINCE steam replaced sails the character and, to some extent, the discipline of the force afloat have become changed. The old-time sailor and marine knew no other life as a calling. They were men of the sea; they loved it and, though they sometimes entered the cavalry or sought the delights of agricultural pursuits, they soon drifted back to the tarry decks, the salt horse and beans and the restless waves. The men of our eastern coast knew no other calling than that of following the sea or something connected with it. This "genus homo" is almost extinct. As a class they were rough, careless of life, but cleanly, they looked upon the ship as their home and they kept it and themselves neat. They smoked pipes and chewed tobacco and the brass-hooped spit-kid was a conspicuous ornament of various parts of the ship; it was there for use and the petty officers were apt to be quick and violent with the man who failed to use it and soiled the deck. The lives of the men were such that the weakly died young and the survivors were the pick of a hardy and robust race.

The man-of-war's men of today come from all parts of the union and they go to sea from love of adventure, to satisfy a desire to see more of the world than that which lies in their own little neighborhood, or to save money enough to make a start in some business. They have no intention to remain afloat always. The individual is frequently something of a mechanic, or becomes so during his term of enlistment. As a rule he is impatient of discipline. He is surrounded by engines of one sort or another and facility in handling these renders him more useful and in-

suers speedy promotion, so he cleans and oils a machine and becomes oily and dirty himself, and his surroundings follow after him as a matter of course.

The modern ship is divided by bulkheads, projections and curves into innumerable compartments and cubby-holes, large and small, light and dark; these are necessarily not under the eye of an officer for the greater part of the day, and men gather in them to loaf and smoke whenever they can do so.

In the modern Navy cigarette smoking has become an almost universal practice; the small size of the cigarette makes it possible for a man to slip into an obscure place, smoke it, drop the stub on the deck and slip away without detection, and this is done as the litter of cigarette and match ends shows. The cigarette ends moistened with saliva, dried by the heat of the decks and powdered by passing feet must be a means of conveying germs to the atmosphere of the decks.

There is less of out-door life for the crew of the modern vessel than for that of the old type. The modern drills do not take the place, as a health giving exercise, of the old sail drills, and between drills the men do not live in the open air to such an extent as formerly, and, also, modern requirements necessitate the employment of much greater numbers in the engine, fire and dynamo-rooms, offices and other places below decks.

These facts make it necessary that every possible means should be taken to insure the cleanliness of the decks and comparative purity of the air which under the most favorable circumstances, must be breathed over two or three times by many of those whose duty keeps them inside and below the greater part of the day. The Master-at-Arms and non-commissioned officers of Marines should be specially chosen and instructed by the medical officer in the importance of hygienic matters. With their conscientious assistance and moral weight with the men, cleanliness, personal and general, can soon be made to become a habit with recruits.

In the struggle for cleanliness the medical officer will be very much worried by the appearance and frequently by the abundance of roaches and other vermin aboard ship. These

pests will collect behind everything which presents a space between it and a bulkhead. The medical officer should therefore make a point of insisting that provisions and bag lockers, pantry shelves and lockers, bureaus, cabinets, etc., shall be so arranged that they can be easily moved out for cleaning and painting behind them.

The decks of the modern man-of-war are covered, in great part, with linoleum: this, when new, is cleanly and forms an efficient protection against the heat and hardness of the metal beneath; it is covered with shellac occasionally and is washed with water free of soap. After a few months, more or less, of wear frayed places appear, the joints open a little, the corners turn up and water finds its way underneath carrying with it dirt and germs. It is of course impossible to prevent this. Our ships are very clean but from the point of view of the sanitarian there is always something left to be desired. A great desideratum is a covering for the decks which can be applied in a semi-fluid state, so that it will conform to the irregularities of the deck without cracks or joints and yet when formed will be soft enough to protect the feet from bruising and be non-conductive of heat.

That germs may harbor in the broken linoleum or under it the following incident seems to show. While at sea along the Pacific coast of Central America numerous cases of severe tonsillitis, with an exudate, appeared among the members of the crews who lived in a part of the ship in which the linoleum was much worn. In the beginning these cases showed the ordinary symptoms of severe attacks of this disease, but, in two or three days a membrane would appear and soon spread over the tonsils and soft palate, and in a few cases into the nose. Generally the cases would recover in a week or so, but some would linger longer and two or three showed the sequelae of diphtheria to a slight degree. The ship had been at sea most of the time for several weeks, so there had been no exposure ashore to diphtheria. There was then no bacteriological outfit aboard so the presence of diphtheria germs could only be inferred from the symptoms. There had been a similar attack the year before, but not so general or so severe. The decks in the part occupied

by these men were washed in a mixture of formaldehyde solution, chloride of lime and sulphate of iron in solution every other day as long as new cases continued to appear, and then once every two weeks, taking care to douche well those places which were lifted from the deck, or much frayed and broken. At first the application caused some irritation of the lachrymal and nasal mucous membranes but this soon subsided. After these applications were commenced the disease began to diminish and soon disappeared.

On two later occasions the same disease appeared, the same measures were adopted, and the disease was soon checked. The medical officers therefore felt justified in believing that the germs were harbored in the dirt collected under the lifted linoleum and in the cracks and frayed places. The men who slept on the deck, while off duty during the day, were in close contact with these places while lying down. Of course our deductions may not be justified for there are other sources from which the germs may have been drawn, or the inflammation may have made latent ones active. Diphtheria is not highly contagious and the escape of other members of the crew may not have been due so much to the precautions taken as to this fact and also to the fact that one is sometimes immune and sometimes not.

On one occasion three cases of measles were found among the men; the eruption had appeared during the night. They were placed in a magazine handling room with their clothes bags and hammocks, and men were forbidden to go into the turrets over them. It was found that a small amount of formaldehyde could be borne in the room with the men. These men were kept there two or three days, until the ship reached port and were then sent to the hospital. The compartment was then well fumigated with formaldehyde. No other cases appeared. The clothes and bedding of men with contagious diseases and of those with bodylice were steamed in the sick-bay bath-tub to which a cover was fitted for the purpose.

After a man has been sentenced by court-martial to undergo a term of confinement in the brig, the medical officer is required to examine the prisoner and the place of confinement and then to

give his opinion as to whether the man can stand the punishment without undue injury. In searching for a positive opinion on the temperature which a man can stand for a month or so, in single irons, on a bread and water diet, with a full ration every third day, it was found that the authorities were very vague on the subject. The brig had passing through one corner the steam pipe to the ice machine; the temperature in the summer and in the tropics varied between 110° and 114° . The room had a cubic space of about 450 feet. The man was a chronic offender, so, after some discussion it was determined to allow the punishment to go on. After the first week the prisoner was given exercise on deck for one hour in the forenoon and one in the afternoon; he was also examined carefully by the medical officer every week. At the end of the thirty days it was found that the prisoner had lost some flesh, but he was able to resume his work on deck without showing any materially bad effects from his confinement. It is true that members of the engineers' force undergo exposure to much greater heat, but the comparison is apt to be misleading, for, after a few minutes exposure, they can retreat to a cool area under the air-shaft for a few moments recuperation, so that their exposure is not continuous for the watch, and they rest and sleep when off watch, in a comfortable temperature, and they have the freedom of their limbs.

It may be well to note here some experience in treating members of the engineers' force who were overcome by heat during the Porto Rico and Santiago expeditions. When the patient was brought into the sick-bay a towel wet in cool water was wrapped around the head and the body was thoroughly sponged with warm water, or, if the degree of exhaustion was light, he was placed in the bath tub with water at the temperature of 80° to 85° for fifteen minutes then in a bunk, and a small dose of acetanilid or phenacetine given him, especially if there was much headache or restlessness. Generally the patient would sleep for an hour or so and wake complaining of weakness and nausea. Most of the cases were overcome by a combination of the effects of the heat and of nausea from over-drinking of lukewarm water. The nausea came on during the watch and prevented their eating

a proper meal. In such cases the best effects were secured from a mixture of whiskey (or alcohol when there was no whiskey or gin), Tr. of capsicum and a bitter. The amount of spirit never exceeded 8 c.c., for a dose large enough to produce the stimulant effect did not act so well locally. In a few minutes after taking this dose the stomach would regain its tone and a meal could be eaten with relish and retained. This cocktail was kept on hand and seemed to ward off many cases of exhaustion by keeping the digestion up to its work.

The medical officer will frequently be interviewed by the crew on the subject of the drinking water, especially when the ship is in the tropics. The ice machines are made and tested in the north where the temperature of the outside water is cool. In the tropics the effectiveness of the machine will be one-half, or even less, than its builder's rate. The crew will also drink more water, and the scuttle-butt will be emptied so often that the water will not have time to cool. Frequently it will be found that the pipes from the water tanks have been carried through the fire-rooms, or ammunition passages, or other specially hot places, so that the water is delivered at the butts and the pantries at a temperature of 100° or over and the ice machine cannot cool it to a pleasantly potable temperature in the time allowed. The lead of these pipes should therefore be carefully traced and the temperature of the water in the tanks and where it is delivered carefully taken as soon as possible after the ship goes in commission as the basis of recommendations for changes.

It is said that the wandering Kirghiz go bare-headed in the early morning, but, as the heat of the sun increases, they add fold after fold of flannel to the head wrappings to ward off the effect of the sun's rays. The theory of the advocates of flannel underclothing in the tropics is somewhat on the same line, but the sailor is not exposed to the direct rays of the sun for any great length of time continuously, and the flannel covering to the body is found very irksome and exhausting and the men will leave it off whenever they can. Cotton undershirt and drawers with cotton jumper and trousers give two layers of clothes and make a very comfortable garb. The natives rarely wear the

underclothes. The cotton hat can be dipped in water or a fold of wet cloth can be laid over the head inside the hat. My experience is that this dress is more comfortable, less exhausting and more healthful than the flannel underwear. Every man should be compelled to put on dry night clothing before turning in. The flannel belly band, on physiological principles is good in cases of diarrhea, while for reasons above given I believe it to be bad as an article of clothing for the well. Frequent bathing in salt water is a most excellent measure and the shower baths now so liberally supplied to ships should have cold salt water, as well as fresh, supplied. A cold salt water shower bath is a most healthful measure before turning in, especially after a warm watch.

It often happens that outbreaks of diarrhea and dysentery follow the receipt of meat from the supply ships in tropical waters. This was especially noticeable during the Santiago campaign. In my experience this is due to lack of proper precautions in the handling of the meat. During the above period and in the trip from New York to the Pacific coast very few cases appeared aboard my ship and these were of short duration and considered to be due to over-eating. In the north, when the supply ship loads, care is taken that the meat shall be fresh, plenty of ice is stowed with it and the machines are adequate to keep up the proper temperature, so that the meat is delivered in good condition. Care was taken that the meat was delivered to our ship with ice and the boat load was covered with canvas; it was immediately transferred with the ice to the cold storage; it was taken out about two hours before it was to be cooked, cut up and placed in cool water until it was transferred to the cooking utensils. It was not allowed to hang in the open air, for, if it did, its surface soon became slimy, and numerous germs were found in some which was thus exposed on one of the ships.

There are many other points which have arisen during my service and which the medical officer will have to learn by experience for none of the books will give him definite rules to meet them, yet the health of the crew, the success of the expedition, will often depend to a great extent upon his vigilance in noting

and overcoming them. He should not in factious spirit, object to everything because he thinks it is wrong but he should study the subject thoroughly from all points of view, and when he has mastered it, he will find all officers ready to listen to him and to further his plans for relief. The ship is a fighting machine aboard which men must live and their comfort must be secondary to the primary object, but there are many things which can be done to promote the health and comfort, and, consequently the effectiveness, of the crew, and these must be the constant study of the medical officer and the subject of his reports.

PORTABLE BICYCLE WHEEL, CAPABLE OF BEING FIXED TO A LITTER.*

CAPTAIN Luce of the Royal Army Medical Corps describes the use of a unique bicycle wheel, which can be attached to the center of a litter, and thus simplifies the transportation of the wounded.

From the nave of the wheel extend four metal arms in the shape of a large "V." The extremities of these arms are joined by two transverse bars, slightly curved, having two curved depressions into which the handles of the litter fit; these are firmly attached to the litter by clamps.

This wheel with its attachments weighs five and one-half pounds, and, when not in use, is carried by litter bearer number 4.

When it is desired to attach it to the litter, numbers 1 and 2 support the litter, and numbers 3 and 4 fix it in place under the litter.

This wheel admits of transporting the wounded over paths, fields, roads, etc., without jolting the patient and without fatigue to the litter bearers. Small obstacles can be crossed without removing the wheel.

A bicycle pump and repair kit are indispensable. Finally these wheels can be carried on top of the ambulance.

*Translated from the Archives de Medecine et de Pharmacie Militaires under the direction of the Military Information Division of the United States Army General Staff by Lieutenant SAMUEL M. DELOFFRE, Assistant Surgeon, U.S.A.

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HAND AND INSTRUMENT DISINFECTION.

By CAPTAIN J. CARLISLE DEVRIES,

BROOKLYN, NEW YORK,

ASSISTANT SURGEON IN THE NATIONAL GUARD OF NEW YORK.

IT is my desire to call attention to a means of hand and instrument disinfection which is known to all of us, but is more certain, more agreeable and cheaper than any now in use. The ideal condition is absolute sterilization, which as yet is unattainable. It might be possible to obtain this end if the unpleasant irritation of formaldehyde could be obviated; even then the patient could not be disinfected in this manner for the same reason and also because of its destruction to mucous membranes.

There are three methods now in vogue, Fürbringer's,—by means of hot water, alcohol and bichlorid of mercury; Kelly's method requiring potassium permanganate and oxalic acid; and, third, the use of chlorid of lime and soda; also various modifications of the above, all of which are imperfect.

If absolute sterilization of the hands is impossible, can they be so disinfected as to prevent the possibility of infecting a patient during an operation?

Landrer and Kramer showed that scrubbing the skin with soap, ether and an antiseptic acted on the surface of the skin alone. It was also proven that more germs could be obtained from the hands after so called disinfection. This is because of maceration of the skin, by long and irritating scrubbing and heating, the germs becoming more easily detached in this condition than when the skin is hard and dry.

Sterility immediately after scrubbing with the disinfectant is not the rule, while in those cases which yield no cultures immediately after the process of disinfection, rapid infection develops when the hands remain dry or are moistened with water while the growth is prolific if the hands are bathed in serum.

Leedham-Green has very thoroughly gone into this question, and has found that mechanical cleansing of the hands, even if sea sand, marble dust or Schleich's soap, or the aqueous solutions of carbolic acid and bichlorid be employed, micro-organisms are still to be found upon the hands, while Kelly's method, he goes on to say, gives wholly inadequate results.

Alcohol possesses a remarkable power of sterilizing the hands, far surpassing that of all other agents, but it possesses this power only in proportion as its strength approaches seventy per cent, absolute alcohol being wholly inefficient.

The most satisfactory of Leedham-Green's experiments was with Fürbringer's method modified; that is, first scrubbing the hands for five minutes with soap and very hot water, changed frequently. The hands are then rubbed with alcohol for three minutes, when they are scrubbed for two minutes in a solution composed of mercury bichlorid 1 part, 70 per cent alcohol 1,000 parts, and then rubbed with a sterile cloth until dry and polished. These experiments yielded only from 9 to 79 per cent of negative results.

Loew and Fischer called attention to formaldehyde as a disinfecting power. The compounds resulting from its use are wholly soluble and in no way interfere with the penetration of the antiseptic. Solutions as weak as 1 to 50,000 are of use. It has proven the most speedy and most penetrating, but has not been used for hand or instrument disinfection on account of the fact that it is unstable, and the liberated gas is irritating to mucous membranes and hardens and roughens the skin, thus perverting sensibility and favoring infection; its use is also painful.

The difficulties inherent in the ordinary antiseptic are as follows:

Chlorid of lime deliquesces and loses its virtue, renders the skin rough and sore, and also renders future sterilization impossible; it likewise rusts instruments and dulls sharp edges. Potassium permanganate has no appreciable antiseptic action on the skin or instruments, for the disinfection of which it has never been used on account, perhaps, among other things, of its opacity. Bichlorid of mercury forms insoluble albuminates, thus

encapsulating the germs. It is also highly poisonous and very irritating to the skin and mucous surfaces, discolours the skin; hardens and roughens it and rusts instruments. Alcohol is expensive.

In using the earlier antiseptics decided inconveniences were constantly experienced that were grumblingly accepted as insuperable,—instability, causticity, toxicity, resistance to solution, and the tediousness of cleansing the hands, besides requiring separate solutions for each process.

The metal instruments must lie in one kind of solution; and, as aluminum came into use for apparatus, great destruction was accomplished before the simple chemical fact became sufficiently well known that alkalis honeycombed these delicate tools and rotted them into uselessness. Then rust was to be avoided, which long immersion rendered liable, so that shortening the process of purification was much to be desired not only for this reason, but to save time before clinical work, and where re-asepsis was imperative, as through an instrument becoming infected.

Cresol as such is insoluble; and it may, therefore, be of interest to know how insoluble cresol came to be employed as a disinfectant.

Being insoluble in water, cresol had been neglected for some time until the idea of putting it to a practical test in combining it with a neutral oil soap as in the preparation of Creolin, by which emulsions of the disinfectant compounds were made possible and found to exhibit the extraordinary germicidal powers of the cresols.

These preparations were only emulsions and it was believed that if cresol could be adopted for use in soluble form, the advantages of such a solution over a mere suspension would be easily demonstrable. Lysol was thus devised.

It is obtained by dissolving in fat and subsequently saponifying the fractional tar oil which boils between 100° to 200° C. making a brown oily looking, clear liquid with a most aromatic creosote like odor.

It contains 50 per cent of cresols and is miscible with water

to a clear saponaceous liquid; it also forms a clear solution with practically everything else.

The essentials of a perfect and ideal antiseptic are:

It must be soluble in water and make a clear solution.

It should arrest instantly the development of bacteria, even in very dilute solutions.

It must be harmless, non-poisonous, non-irritative, and non-corrosive.

It must not be too expensive.

Lysol meets these requirements.

The property of solubility in water has given the preparation its name.

It forms clear mixtures at once in all proportions and at all temperatures.

It possesses the property of a saponaceous solution which renders the use of a special soap unnecessary.

The general process of cleansing and disinfecting the hands, instruments and areas of operations are completed in a single act, viz., an energetic brushing with a two per cent solution of Lysol. It acts in a manner equal to the best soap as a cleansing agent which removes all dirt, fat or resinous spots from the skin, as well as from surroundings, linen, instruments and the like.

Strassman says that resistant spores of anthrax can be destroyed by a three per cent solution of Veroform within twenty-four hours.

With Lysol the growth of anthrax diminished in two and one-half hours, and were all destroyed and no further development witnessed after six hours with a two per cent solution.

Surgeon General Pfuhl reports that a one per cent solution of Veroform destroys the staphylococcus pyogenes aureus in from one to three hours.

With Lysol the growth diminished after two minutes exposure to a one-fourth to one per cent solution; the growth was destroyed or arrested after fifteen minutes exposure in the same solution, and destroyed after five minutes exposure in a one per cent solution.

Lysol destroys streptococci after fifteen minutes exposure in a one and one-half per cent solution.

These experiments were made abroad by Cramer, Schleich, Wehmer, Michelson and others, and substantiated in this country by Hanks, Williams, Stewart and others.

With Veroform from seventy-five per cent to ninety-three per cent were negative.

With Lysol the average negative results were about ninety-six per cent.

The efficiency of Lysol is enhanced by the saponaceous medium in which it is held, which dissolves all fats and oils and exposes the germs to the immediate destructive action of the cresol which has a high disinfecting power. It loosens by deep penetration all germ life and destroys it. Lysol has the effect of exposing all bacteria to the destructive action of the cresol therein contained, which is held by the solvent in contact with the germ, for Lysol is a stable solution. No less important is the freedom of the antiseptic from any acid or irritant, the soap itself being absolutely neutral.

Lysol can be used alone. Instead of scrubbing with soap and water, Lysol is poured on the hands and is used as soap, and throughout any major or minor operation, and until the last dressing is applied Lysol alone is used.

Creolin as a disinfectant is out of the question, except as a deodorant, as it becomes turbid and opaque upon the addition of water, and instruments cannot be seen. Lysol is clear as water, and any instrument can be picked up easily at any time.

Freedom from acid or irritant enables its use upon the most sensitive and delicate tissues of the body; and no harm can come to anyone even if a concentrated solution is used.

Owing to the great popularity among the medical profession and to its tried and tested reliability, the Pharmacopoeia Commission thought it advisable to incorporate Lysol as an official preparation; but experiments have proven that the preparation made from the U.S.P. formula does not give the same results, because of its non-neutrality, as the preparation that has been upon the market for years.

The following technique is reliable for disinfecting hands.

Each hand should be scrubbed for five minutes with a two per cent solution of Lysol and hot running water.

Instruments should be placed, after boiling, in a two per cent solution of Lysol, until ready for use.

It has absolutely no effect on the cutting edges of instruments.

Lysol offers the best means of sterilizing the hands and instruments. It does more than other disinfectants will do under the most exacting circumstances.

It destroys germs and spores more quickly than any other antiseptic, and will penetrate and kill germ life where no other disinfectant can reach. It does not roughen the hands nor harden the skin, and is unirritating, leaving no unpleasant after effects, and in other respects it is more agreeable than any disinfectant now in use.

The value of Lysol as a disinfectant for the hands and instruments and field of operation is well known.

I wish also at this time to call your attention to its efficacy in cerebrospinal meningitis, in which it is specific; really an antitoxin.

We are indebted to Seager for the publication of a new method of treatment, a new use for Lysol, the results of which are most encouraging. His experience is based upon his observations in a series of cases of the epidemic form of cerebrospinal meningitis at Lisbon.

Seager does not state who first introduced this plan of treatment, but simply reports his observation at the Special Hospital at Lisbon.

This treatment consists of lumbar puncture and the withdrawal by aspiration of varying quantities of cerebrospinal fluid from the spinal canal, frequently amounting to 50 c.c. Artificial serum is then injected with the same syringe, the needle being left in situ, and the surrounding parts are washed with serum; lastly, a quantity (from 9 to 12 c.c.) of a one per cent solution of Lysol is injected through the same instrument and the needle withdrawn. The temperature falls immediately, but rises again

after one to three days, when the puncture and injections are repeated, and so on until only quite clear and limpid fluid is withdrawn after puncture, when the injection of lysol is stopped. Afterward a few punctures are made to see if the fluid continues clear.

Of the thirty-one cases in Lisbon which were treated with Lysol, thirteen died—five from dilatation of the cerebral ventricles, two from pulmonary tuberculosis, one from edema of the glottis, one from purulent pneumonia and four from the disease with complications. The thirteen recovered were *completely* cured.

The early plan of treatment in this same epidemic was by the bath and ice bag to the head. Under this regime sixty per cent died. Then simple lumbar puncture of the spinal canal was tried in twenty cases, in three of which the fluid was already purulent; of these twenty, nine died, and of the eleven who recovered, one was deaf, one had persistent paralysis of the left arm and four had bed sores. The next seven cases were treated with puncture, removal of the fluid and an injection of oxycyanide of mercury; of these seven four died and three were cured. The fluid was purulent in five of these cases, four of which proved fatal.

The number of cases treated by lysol could have been increased had Seager included twenty cases which were under treatment at the time of his report, but inasmuch as the duration of this disease is often long, he did not include those under treatment, although he states that a majority of them were in such good condition that their recovery seemed assured, hence the results of the treatment are even better than fifty-seven per cent of complete recoveries in the thirty-one cases noted above.

The presence of the meningococcus was the only characteristic bacteriological finding in the cases.

Of the three cases reported by Manges of New York the first was a meningococcus infection, and the second a virulent streptococcus.

In the first case, after the first injection the patient seemed to hold his own, while following the second, his recovery was rapid and uneventful.

Of the second case he speaks with much more assurance, since, at the Mt. Sinai Hospital, death has resulted in every case of cerebrospinal meningitis in which the streptococcus was found in the fluid obtained by lumbar puncture. The condition of the child at the time of the lysol injection was so desperate that no one who saw the case expected him to survive the night, hence his complete recovery without any after effects is all the more gratifying. It is to be noted that the washing out of the spinal canal with artificial serum, (normal saline solution), was omitted in all of these patients. The injections were all made without anesthesia, except the first one in the child, which was done under slight chloroform narcosis; no pain was complained of and no unpleasant after effects were noted.

The quantity of lysol solution injected is from 3 to 9 c.c. for children, and 12 to 15 c.c. for adults, being introduced very slowly.

I have been told by those who have had experience with lysol in the field that it is a substance which meets the requirements better than any other antiseptic for a ready and safe means of cleansing wounds, and it is my opinion that it should be added to the regular list of drugs on the supply table.

In obstetrical practice lysol is most efficacious as it cleanses mechanically and then acts as an antiseptic.

Much has been claimed for antiseptic soaps but their efficacy is mostly in the mechanical sterilization which may be obtained by the use of most any soap. Also, any antiseptic which is contained in the soap soon deteriorates from exposure.

DISCUSSION.

Major HENRY ALLERS, N.G.N.J.—I wish to endorse everything Captain DeVries has said regarding lysol. I have used it for five years, particularly in obstetrical and gynecological cases and in cases of puerperal septicemia. I use it a dram to the quart. I recently saw a case of puerperal septicemia which had been handled by a midwife. Patient's temperature was 104.4. I douched her with a solution of lysol, and the next day her temperature was 99½. This was not my first experience.

Dr. HAROLD D. CORBUSIER, U.S.A.—I also have had experience with lysol in obstetrics and in filthy wounds, such as are occasioned by accidents caused by sailors falling in the holds of ships. In all these accident cases the first thing we did was to use lysol with sterile water, and continue washing

until the wound was clean. The results were always most satisfactory. In obstetrics I have always used it, and shall continue to until I find something better.

Dr. J. LISANDRO MEDINA, Nicaragua.—It is impossible to absolutely sterilize the hands with anything in existence. Dawbarn at the New York Polyclinic uses pure carbolic acid for thirty seconds and then pure alcohol. Instruments are not dipped in any solution after being boiled in sterile water, and then wrapped in sterile towels. I think this the better method. Gloves should also be worn. I know lysol is good and like it.

Major THOMAS E. CARMODY, N.G.Colo.—Dr. Medina says that instruments should be kept dry. In nose and throat work it is almost impossible to keep them dry and keep them anywhere near sterile so as a rule I keep mine in a solution of from two to five per cent lysol. Captain DeVries says that is stronger than I require, and I shall in the future use a one per cent solution.

Captain DEVRIES (Closing).—The methods mentioned by Dr. Medina in vogue at the New York Polyclinic are well known, but that is one of the many imperfect methods. I have advised lysol because it has been proven by exhaustive experimentation here and abroad that the percentage of negative bacterial results is about 100 per cent. We all know how impossible it is to have absolute sterilization, and for that reason the lysol method is advocated as meeting the requirements most effectually. It is needless for me to state that rubber gloves are worn at all operations, the gloves being dipped in a two per cent solution of lysol after thorough sterilization.

GUNSHOT WOUNDS OF BLOOD-VESSELS.

EIGHT cases of gunshot wounds of blood-vessels (Brentano, Berlin) were treated at the Charbin hospital of the German Societies of the Red Cross. The cases were alike in that all presented wounds inflicted by Japanese rifle-bullets (caliber, 6.5 mm.), and in all cases the skin wound of entrance had, at the time of admission, nearly or entirely healed. Of the eight, seven were operated upon. The eighth case revealed at the autopsy a gunshot perforation of the aorta. This patient lived seventy days after receiving the injury, and died of the results of secondary hemorrhage, not of the perforated aorta, but of the liver. The operation in the seven cases consisted in free incision at the site of injury, double ligation of the vessel and its branches, and resection of same and all recovered.—*Annals of Surgery*.

Contemporary Comment.

THE STATUS OF THE MEDICAL OFFICER.

THE status of medical officers remarks *American Medicine*, has again been brought to notice by the results in Manchuria. They were once barbers and mere civilian hirelings, paid to follow the higher officers like valets, but when medicine became scientific they were found to be indispensable and educated skilled gentlemen were selected. It was soon found that civilians in an army were treated with such scant courtesy by commissioned officers, that rank was a positive necessity or the sick soldiers could not be cared for. In armies the value of opinions depends wholly upon the rank of the man. What Tommy Atkins says is ignored, but the Colonel is listened to even if he is a fool. Then sanitation became a science and it was reluctantly discovered that the medical man did infinitely more good in preventing illness than he did in curing what was preventable. He became an essential part of the military machine, to keep it in fighting condition. Nevertheless he is still considered a non-combatant, a fact which medical officers of spirit are beginning to resent as insulting. They are in the most dangerous places, they have a higher percentage of killed and wounded than any other staff department, they are now devising means whereby campaigns may be made in situations formerly invariably fatal, and yet are noncombatants, while a civilian lawyer appointed a judge-advocate—who never hears a bullet or smells blood, is a combatant in the eyes of the law. Could absurdity be carried further? Such things make us seem a nation of mental invert—reasoning in an upside down fashion.

The word noncombatant is used with a sting, which implies that a noncombatant doctor on the firing line is not as patriotic or brave as a combatant commissary somewhere in the rear bar-

tering for beef and potatoes. It is a word that should be eliminated from the military organization in which every soul under discipline is a combatant in every sense of the word—doing all in his power to injure the enemy. The medical profession should resent this anomalous and useless law, and every physician should insist that if the nation ever needs him it can have him as a combatant. The status of the medical officer in the national guard or regular army or volunteers will never be restored to its normal, so long as the medical profession is willing to let the Geneva convention imply that doctors are not willing to fight for their country—the only noncombatant part of the nation. A grocer can become a combatant commissary; a railroader become a combatant quartermaster, a clerk become a combatant adjutant, a lawyer a combatant judge-advocate, a civil engineer can become a combatant military engineer, even a clergyman of the religion of Jesus Christ can become a combatant, but a doctor cannot legally be considered a combatant for his wife, children, fire-side, and native land unless he deserts his chosen profession. No staff officer is required to know so much about military affairs as the surgeon, and yet, by law he is still classed with the paymasters who cannot exercise command, as they are men having no military duties beside paying out money, and who are not selected by any professional examination.

The Geneva convention is responsible for present conditions. It was devised and adopted before sanitation was a fact, and it is based on the theory that a doctor has nothing to do with military efficiency but is wholly occupied in relieving the sufferings of soldiers who are so injured that they cannot fight any more. It presumes that the doctor is not a patriot who will do all he can to make his own army efficient. It is based upon a mawkish sentiment of universal brotherhood—very good and noble as an ideal, but wholly out of place in situations where it is a duty to one's native land, to disable its enemies. If a doctor is not a traitor his sole desire should be to do all in his power to help his own army and cripple that of the enemy. That desire will not prevent any one being humane to a helpless prisoner of war, and as an actual fact it is found that civilized combatants are as hu-

mane as the noncombatants. A doctor will be just as noble if he is a combatant, too.

The need of a new Geneva convention is the great lesson from mild bullet wounds. The present international law required the Japanese to send back to the Russian army all the captured Russian surgeons, and the men promptly went to work healing the injured and in three months had the army efficient again. This absurd exaggeration of philanthropy compelled the Japanese to assist their enemy, to prolong the war, and thus to increase deaths and suffering and expense and horrors of all kinds inseparable from war. It defeats its own purpose. Times have changed since 1860 and we need a new Geneva convention which will tend to end wars, not to prolong them, and which will recognize the medical officer as combatant, parts of the fighting machine, yet always humane enough to heal the captured enemy as faithfully as his wounded friend. Above all else the importance of military sanitation must cause all physicians to insist upon the abolition of the old absurdity of any part of any army being non-combatant. A few medical officers have preached these views for a long time, and the Japanese war has shown that they were right.

MOSQUITOES ON THE ISTHMUS.

THE conditions, says Gorgas, were very different from those in Havana, fully 90 per cent of the Panama mosquitoes being *stegomyia* against 5 percent in Havana, and the territory covered being very much larger. The practical result, however, has been the same in the stamping out of yellow fever. Malaria, however, is the principal difficulty, but here the results have also been favorable, the principal recourse being superficial ditching. Out of 22,000 employees in October last there were only 21 per 1,000 on the sick list, and he thinks the health conditions are fully as favorable as they would be in similar work in Maryland or in Pennsylvania.

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Haga (J.) [Some data on the teeth of our soldiers.] *Janus*, Haarlem, 1906, xi, 25.

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Kuznetski (D. P.) and Roze (F. Y.) [Brief report of the operative activity of the temporary Red Cross Hospital in Blagovështshenk on the Amur, from July 1 to September 25, 1904.] *Khirurgia*, Mosk., 1905, xviii, 478-490.

Editorial Expression.

THE UNDERGROUND LODGINGS OF THE JAPANESE ARMY.

DURING the Manchurian winter the Japanese did not content themselves in camp without the protection of actual roofs. Many of the villages had been destroyed by the Russians on their retreat; on the first lines houses practically no longer existed, those which remained being too dangerous to oc-



A Japanese Underground Lodging.

cupy; but on both the Russian and Japanese sides there were constructed veritable underground camps. The front was a vast molehill. The ingenuity and the adaptability of the Japanese

were given free course in various kinds of construction. Some of them were of a character altogether provisional. Others were prepared with a view to a prolonged residence, and still others were strong casemates able to resist heavy shells.

The more simple, says *Le Caducée*, were entrenchments circular or rectangular, two meters in depth, and three meters wide, covered by a roof of sorghum sustained by a light framework. A layer of earth covered the sorghum. Three openings gave access to the interior. Heating was done by means of a brazier or by a simple fire, and an opening was carried up into the roof for the passage of the smoke. These structures were nothing but temporary posts for the night, occupied by ten or twelve men.

The greater number of these underground cantonments however were made in the following manner. A rectangular entrenchment, two meters deep, five long and four wide, was dug and covered with a roof of sorghum and earth. Upon one of the short sides of the rectangle, generally that which looked south, the earth was raised slightly for the length of three to four meters. On this short side was built a wall of earth in which opened a door and one or two windows. Access to the living room was thus made more easy and ventilation better. Into the roof was let an opening for the passage of the gas and smoke. On each of the long sides camp beds were cut out in the earth, sufficient for a dozen men.

But there were also subterranean arrangements for the lodgement of thirty to forty men. A number of these were to be seen on the lines at Chao. The disposition was a little different from that which has been described. A rectangular entrenchment fifteen meters long, by three meters fifty wide and three meters high was dug in the earth. One of the long sides was generally made to face the south, and on that side were found the entrances. These were made by two stairs of five or six steps. Below the staircase was a door made of matting or sacks; sometimes there was a regular door taken from a Chinese house. The roof, of sorghum covered with earth, was flat and very slightly inclined from front to rear. In the roof were cut two openings about one-half meter square. A camp bed occupied the long side facing

the entrance. Many of them were also constructed on the principle of the Chinese kang. The warm air came from the cookstove which was placed in the corner of the room. The cooking was separated by a light sorghum partition, and over the stove an opening was made in the roof for passage of the smoke. Mats were placed upon the kang. Against the walls hangings of sorghum gave to the place an air of decency and afforded protection from contact with the earth. A shelter of earth and a palisade of sorghum protected the cantonment against the north wind.

Light was obtained from oil, candles or petroleum. The latrines were always found at a little distance. In the neighborhood of the cantonments there was almost always an improvised bath made in the Chinese form provided with a brick stove.

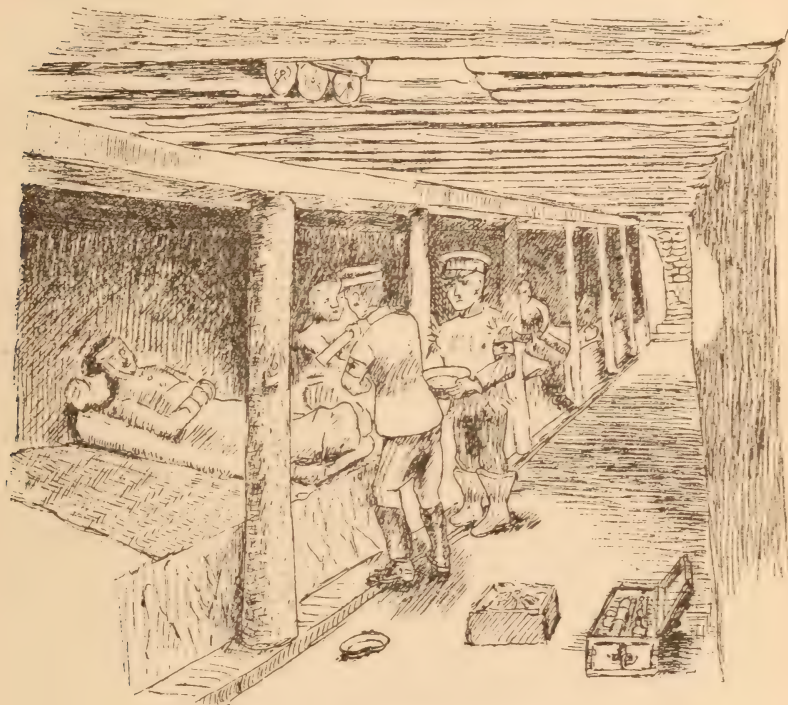
These shelters were very good for a country like Manchuria where not a drop of rain falls during the cold season.

During winter the shelters for sentry boxes were cut a yard and a half deep in the earth and covered with a conical roof of sorghum. In the trenches of the first line could be found veritable lodgings with traverses of wood, across which branches, matting and earth had been thrown. Here and there on the flanks of the trenches redoubts had been made, in which men could gather and group about a brazier when they were not on duty. Similar lodgings a little more spacious for officers were equally scattered throughout the trenches.

This subterranean life, according to the information of the Japanese surgeons, had no bad effects upon the men. The soldiers occupied them only at night; they passed the entire day in the open, a thing made possible by the beautiful climate of the Manchurian winter.

Before leaving the subject of subterranean habitations, mention should be made of the structures of this kind used for the sanitary service of the front. In one case, a rectangular trench, twenty-five meters long by three and a half wide and two and a fourth high was dug sixty meters behind a Chinese temple, surmounted by a high outlook which dominated the entire plain, and served as a post of observation. The roof was formed by

two layers of trunks of trees, fifteen to twenty centimeters in diameter laid horizontally. Upon these were placed sacks of earth, one meter in thickness, and all was covered with a thick layer of earth. Two windows were arranged in the roof, pyramidal in shape, and seventy centimeters on each side of the base, fifty centimeters to the peak. The tree trunks were supported



A Japanese Underground Infirmary.

in the middle by perpendicular posts five meters apart. A camp bed was cut out in the earth two meters long, one meter eight wide and sixty centimeters high. The place was heated by a stove made of brick, Russian fashion, and placed in the middle of the camp bed. Light was furnished by candles and coal oil lamps.

This infirmary was entered by two covered ways, on the right and left respectively, one meter and a half wide and the same depth, making an angle upon their arrival at the infirmary door. The side of the passage which faced the enemy was also protected by an earthwork of sacks a meter in height. A wooden door with a paper window, at each end of the passage gave entrance to a point where, by descending three steps admittance could be gained. The entrance was also protected by a cover made of trunks of trees covered with sacks of earth. This protection appeared to be sufficient to resist projectiles of 15 cm. caliber. It is difficult to understand however why this infirmary was placed so near the outlook, on which the Russians constantly fired.

After the battle of Mukden another infirmary of this kind was seen on the borders of Chao, but it was abandoned. It was very solid and the tree trunks had been replaced by railway rails. The sick and wounded found there but temporary shelter, and after a night or two were evacuated to the hospitals.

These infirmaries were very defective for prolonged residence, ventilation being insufficient and the wounded not having the opportunity of passing the day in the sun and breathing the pure air as did the well who occupied such subterranean shelters.

FIRST AID DOGS IN MANCHURIA.

THE Bulletin of the American National Red Cross notes that after the battle of Cha-ho three dogs discovered twenty-three wounded who would have been abandoned and would otherwise have died. The Russian commander in reporting their work makes the curious observation that the dogs, accustomed to Europeans, had never discovered any Japanese wounded. These dogs, generally collies, were trained to become accustomed to firing, never received any food save from their masters, and were taught to go willingly into battle. When a dog finds a wounded man he is trained to bark until the litter bearer, guided by his barking, reaches the patient. The Russian report remarks, "what services may not be expected from this modest four-footed creature, whom neither the obscurity of the night, the advance sentinels of the enemy, nor the roar of the cannon turns from his task!"

News of the Services.

Dr. George F. Adair, U.S.A., ordered from Fort Washington to Fort Wadsworth.

Passed Assistant Surgeon J. W. Ames, P.H.&M.H.S., ordered from Gulfport, Miss., to temporary duty in the Hygienic Laboratory.

Passed Assistant Surgeon J. F. Anderson, P.H.&M.H.S., granted one month's leave.

Surgeon W. L. Angeny, U.S.N., ordered from the Philadelphia Naval Hospital to Guam.

Assistant Surgeon F. A. Ashford, P.H.&M.H.S., granted one and one-half months leave.

Passed Assistant Surgeon J. W. Backus, U.S.N., ordered from the *Texas* to the Guantanamo naval station, with additional duty on the *Amphitrite*.

Captain David Baker, U.S.A., ordered to report to the Commanding General of the Army of Cuban Pacification for duty.

Surgeon T. A. Berryhill, U.S.N., ordered from the Naval Medical School to command the Naval Hospital at New Fort Lyon, Colo.

Captain James L. Bevans, U.S.A., ordered to duty with the provisional government, Havana, Cuba.

Passed Assistant Surgeon Rupert Blue, P.H.&M.H.S., ordered to report to the Bureau for instructions relative to the inspection of certain stations in Virginia.

Passed Assistant Surgeon F. M. Bogan, U.S.N., discharged from treatment at the Washington Naval Hospital and granted three months leave.

Assistant Surgeon J. C. Boggess, P.H.&M.H.S., ordered to temporary duty at Buffalo, N.Y., and return to Stapleton, N.Y.

Captain Perry L. Boyer, U.S.A., promoted from Lieutenant, October 30, 1906, and ordered from Fort Sam Houston to the Hot Springs Army and Navy General Hospital.

Dr. Frederick D. Branch, U.S.A., granted three months leave with permission to go beyond the sea.

Assistant Surgeon F. H. Brooks, U.S.N., ordered to the Mare Island Naval Hospital.

Dr. Wilmont E. Brown, U.S.A., granted three months leave.

Surgeon W. H. Bucher, U.S.N., ordered from the Providence Naval Recruiting Station to the Boston Naval Hospital.

Dr. John L. Burkhart, U.S.A., granted one month's leave from Fort Sheridan.

Medical Inspector J. C. Byrnes, U.S.N., promoted from Surgeon, October 7, 1906.

Acting Assistant Surgeon D. H. Casto, U.S.N., ordered to the Naval Medical School.

Surgeon R. B. Chapman, U.S.N., ordered from the *Supply* to the Cavite Naval Station.

Captain James R. Church, U.S.A., ordered to duty with the provisional government, Havana, Cuba.

Assistant Surgeon G. L. Collins, P.H.&M.H.S., ordered from Cape Charles Quarantine Station to Norfolk, Va., for special temporary duty and return.

Lieutenant H. W. Cowper, U.S.A., ordered from Camp Columbia to Caibarien, Cuba.

Captain Walter Cox, U.S.A., ordered from Fort Reno to Fort Sill.

Surgeon R. P. Crandall, U.S.N., ordered from the U.S.R.S. *Hancock* to the *Georgia*.

Dr. Charles W. Cullen, U.S.A., ordered from Cincinnati to Fort Sill.

Surgeon L. W. Curtis, U.S.N., ordered to the *Connecticut*.

Passed Assistant Surgeon J. P. de Bruler, U.S.N., ordered to the *Paducah*.

Captain Wilson T. Davidson, U.S.A., granted two months leave.

Surgeon Corben J. Decker, U.S.N., granted three months sick leave.

Passed Assistant Surgeon C. H. DeLancy, U.S.N., ordered from the *Paducah* to the U.S.R.S. *Hancock*.

Major George D. Deshon, U.S.A., ordered to Rochester, Minn., for observation and treatment.

Assistant Surgeon Paul Dessez, U.S.N., ordered to the Washington Marine Barracks.

Medical Director D. Dickinson, U.S.N., relieved from command of the Washington Naval Hospital.

Acting Assistant Surgeon M. Donelson, U.S.N., ordered to the Naval Medical School.

Medical Inspector N. H. Drake, U.S.N., retired to date from October 6, 1906.

Lieutenant William A. Duncan, U.S.A., arrived in San Francisco for a month's leave from the Philippines, and ordered to report to the Superintendent of the Army Transport Service in San Francisco.

Captain Douglas F. Duval, U.S.A., ordered from Matanzas to Camp Columbia, Cuba.

Captain William R. Eastman, U.S.A., promoted from Lieutenant October 30, 1906, and ordered from the Presidio General Hospital to Fort Lawton.

Assistant Surgeon General J. M. Edgar, P.H.&M.H.S., ordered to Harrisburg, Pa., for special duty and return.

Surgeon J. M. Edgar, U.S.N., ordered to the U.S.R.S. *Wabash*.

Captain Benjamin J. Edgar, U.S.A., ordered to Fort Reno.

Captain George M. Ekwurzel, U.S.A., returned to Fort Keogh from practice march.

Assistant Surgeon C. F. Ely, U.S.N., ordered to the naval recruiting station Buffalo, N.Y.

Assistant Surgeon W. G. Farwell's order to the *Connecticut* revoked.

Surgeon J. G. Field, U.S.N., relieved from temporary duty at the Washington Marine Barracks and ordered from the Bureau of Medicine and Surgery to command the Naval Hospital at New Fort Lyon, Colo.

Surgeon H. B. Fitts, U.S.N., ordered from the *Lawton* to the *Buffalo*.

Lieutenant Charles L. Foster, U.S.A., ordered from transport duty to the Presidio General Hospital.

Assistant Surgeon W. H. Frost, P.H.&M.H.S., ordered from the U.S. Revenue Cutter *Chase* to the Revenue Cutter Service School of Instruction Arundel Cove, Md.

Captain Nelson Gapen, U.S.A., ordered to accompany troops from Columbus Barracks to the Presidio of Monterey.

Medical Inspector J. E. Gardner, U.S.N., ordered from the U.S.R.S. *Wabash* home to wait orders.

Assistant Surgeon P. E. Garrison, U.S.N., ordered from the Naval Medical School to duty as medical zoologist for the Bureau of Science at Manila.

Passed Assistant Surgeon A. J. Geiger, U.S.N., ordered from the Mare Island Naval Hospital to Guam.

Surgeon John Godfrey, P.H.&M.H.S., placed on waiting orders on account of disability.

Passed Assistant Surgeon Joseph Goldberger, P.H.&M.H.S., appointed delegate to the American Public Health Association meeting in the city of Mexico.

Dr. Verdo B. Gregory, U.S.A., granted three months leave.

Surgeon W. B. Grove, U.S.N., ordered from the Boston Naval Hospital to the *Iowa* and granted twenty days leave.

Captain James F. Hall, U.S.A., promoted from Lieutenant, October 30, 1906, and ordered to Fort Flagler.

Major H. M. Hallock, U.S.A., left Madison Barracks, N. Y., for medical treatment in New York City.

Captain H. S. Hansell, U.S.A., ordered from Camp Columbia to Bejucal, Havana, for duty.

Dr. Daniel W. Harmon, U.S.A., ordered from Nashville, Tenn., to Fort Hancock.

Acting Assistant Surgeon C. G. Hart, U.S.N., ordered from the Buffalo Recruiting Station to the Providence Recruiting Station.

Dr. Melville A. Hays, U.S.A., ordered from Fort Casey to Fort Stevens for temporary duty.

Dr. John R. Hereford, U.S.A., ordered from Fort Screven to the Hot Springs Army and Navy General Hospital for treatment.

Captain Louis T. Hess, U.S.A., ordered from Fort Lawton to Fort Porter.

Lieutenant James D. Heysinger, U.S.A., ordered to Key West.

Colonel John Van Rensselaer Hoff, U.S.A., left the Headquarters Department of the Missouri en route to Manila.

Passed Assistant Surgeon R. C. Holcomb, U.S.N., ordered to additional duty as Quarantine Officer at Culebra, W.I.

Dr. Leonard S. Hughes, U.S.A., granted one month's leave.

Dr. Michael E. Hughes, U.S.A., granted four months leave from the Philippines.

Dr. Alva R. Hull, U.S.A., ordered to accompany troops from San Francisco to Fort Logan and thence to proceed to his home at Oconomowoc, Wis., for annulment of contract.

Dr. Arthur R. Jarrett, U.S.A., ordered from Fort Totten to temporary duty at Fort Wood.

Surgeon M. K. Johnson, U.S.N., ordered from the *Iowa* home to wait orders.

Lieutenant Harold W. Jones, U.S.A., ordered from the Department of California to the Philippines.

Dr. James S. Kennedy, U.S.A., returned to Fort Omaha from leave.

Passed Assistant Surgeon J. T. Kennedy, U.S.N., ordered from the Guantanamo Naval Station home to wait orders.

Dr. Clarence C. Kress, U.S. A., ordered from St. Louis to Fort Reno.

Surgeon C. D. Langhorne, U.S.N., ordered from the *Brooklyn* home to wait orders.

Surgeon P. Leach, U.S.N., ordered from the *Indiana* home to wait orders, and when discharged from treatment at the New York Naval Hospital to the U.S.R.S. *Hancock*.

Captain William F. Lewis, U.S.A., ordered to Washington for promotion examination.

Acting Assistant Surgeon S. D. W. Light, P.H.&M.H.S., granted one month's leave.

Passed Assistant Surgeon John D. Long, P.H.&M.H.S., ordered from Manila to San Francisco.

Dr. Lester W. Lord, late U.S.A., and Miss Rena A. Thompson, recently graduated from the Lawrence, Mass., General Hospital, were married at Andover, Mass., October 22. Dr. Lord has an extensive practice at West Ossipee, N.H.

Lieutenant Albert G. Love, U.S.A., ordered from the Department of California to the Philippines.

Lieutenant Robert C. Loving, U.S.A., ordered to the West Point Military Academy.

Surgeon G. P. Lumsden, U.S.A., ordered from the *Minneapolis* home to wait orders.

Captain Theodore C. Lyster, U.S.A., returned to Ancon, Canal Zone, from leave.

Acting Assistant Surgeon J. T. McCormac, P.H.&M.H.S., granted one month's sick leave.

Major Champe C. McCulloch, U.S.A., granted one month's leave.

Dr. Samuel B. McPheeters, U.S.A., ordered from St. Louis to Fort Robinson.

Passed Assistant Surgeon J. D. Manchester, U.S.N., ordered from the U.S.R.S. *Hancock* to the Philadelphia Naval Hospital.

Captain C. J. Manly, U.S.A., ordered to report to the Commanding General of the Army of Cuban Pacification for duty.

Lieutenant Colonel Louis M. Maus, U.S.A., returned to headquarters Department of Texas, from leave.

Surgeon V. C. B. Means, U.S.N., ordered from the San Francisco Naval Recruiting Station to the Mare Island Naval Hospital.

Assistant Surgeon J. B. Mears, U.S.N., ordered from the *Minneapolis* home to wait orders.

Dr. John N. Merrick, U.S.A., granted one month's extension of leave and ordered from Fort Missoula to the Philippines.

Captain R. E. Metcalfe, U.S.A., promoted from Lieutenant, October 30, 1906.

Lieutenant E. W. Miller, U.S.A., ordered from Camp Columbia to Santa Clara, Cuba.

Captain Reuben A. Miller, U.S.A., promoted from Lieutenant, October 30, 1906.

Dr. William G. Miller, U.S.A., granted one month's leave.

Dr. Frederick H. Mills, U.S.A., relieved from duty in the Philippines and the transport *Ingalls*, and ordered from Newport News, Va., to Fort Assiniboine.

Surgeon J. M. Moore, U.S.N., ordered from the *Nevada* home to wait orders.

Assistant Surgeon C. B. Munger, U.S.N., ordered from the *Pensacola* to Guam.

Dr. Ralph W. Newton, U.S.A., ordered from New York to Fort Niagara.

Passed Assistant Surgeon H. E. Odell, U.S.N., ordered from the *Wisconsin* home to wait orders.

Surgeon E. G. Parker, U.S.N., ordered to the New York Naval Hospital.

Passed Assistant Surgeon H. B. Parker, P.H.&M.H.S., granted two and one-half months leave.

Passed Assistant Surgeon J. H. Payne, Jr., U.S.N., ordered to the Marine Recruiting Party at Atlanta, Ga., and to the Providence Recruiting Station.

Captain James M. Phalen, U.S.A., promoted from Lieutenant, October 30, 1906.

Dr. Henry du R. Phelan, U.S.A., ordered from Fort Rosecrans to the Presidio of Monterey.

Dr. Joseph Pinquard, U.S.A., ordered to Fort Robinson for temporary duty, and from Fort Robinson to Fort Meade.

Dr. Julius M. Purnell, U.S.A., ordered from the Presidio of Monterey to the department rifle range, Point Bonita, Cal.

Captain Charles A. Ragan, U.S.A., promoted from Lieutenant, October 30, 1906, and ordered from the Hot Springs Army and Navy General Hospital to Fort Monroe.

Dr. James Reagles, U.S.A., ordered from Fort Keogh to Fort Ontario.

Dr. Michael A. Rebert, U.S.A., returned from West Point to Fort Totten.

Captain Thomas L. Rhoads, U.S.A., ordered from West Point to Fort Crook.

Captain Edwin W. Rich, U.S.A., promoted from Lieutenant, October 30, 1906.

Lieutenant R. L. Richards, U.S.A., ordered from Caibarien to Santa Clara, Cuba.

Dr. George H. Richardson, U.S.A., ordered from Angel Island to the Presidio of San Francisco.

Surgeon General Presley Marion Rixey, U.S.N., ordered to accompany the President of the United States to Panama and Porto Rico.

Captain F. F. Russell, U.S.A., ordered from the Presidio of San Francisco to temporary duty in the office of the Surgeon General.

Acting Assistant Surgeon L. B. Shehan, P.H.&M.H.S., granted one month's sick leave.

Assistant Surgeon F. M. Shook, U.S.N., ordered from the Mare Island Navy Yard to the Mare Island Naval Hospital.

Dr. Ernest F. Slater, U.S.A., ordered from Fort Hancock to Fort Banks.

Dr. John T. H. Slayter, U.S.A., ordered from San Francisco to Fort William Henry Harrison.

Major Henry D. Snyder, U.S.A., on detached service with troops en route from Fort Sam Houston to Fort Reno.

Dr. Charles H. Stearns, U.S.A., ordered from Fort Monroe to Fort Screven.

Lieutenant Chester J. Stedman, U.S.A., granted one month's extension of leave.

Captain Samuel L. Steer, U.S.A., returned to Fort Assinniboine from leave, and ordered to report to the Commanding General of the Army of Cuban Pacification for duty.

Captain John H. Stone, U.S.A., ordered from duty with the 11th Cavalry, Camp Columbia, to Matanzas, Cuba.

Assistant Surgeon E. M. Steger, P.H.&M.H.S., ordered from the revenue cutter *Algonquin* to New York.

Surgeon E. R. Stitt, U.S.N., ordered to the Naval Medical School.

Surgeon George W. Stoner, P.H.&M.H.S., ordered from Ellis Island to Charleston, S.C., for special temporary duty, and return.

Medical Director T. H. Streets, U.S.N., ordered to command the Washington Naval Hospital.

Passed Assistant Surgeon H. F. Strine, U.S.N., ordered from the New York Naval Hospital to the Newport Naval Hospital.

Dr. Harrison W. Stuckey, U.S.A., granted one month's leave.

Lieutenant Edward M. Talbott, U.S.A., ordered from Fort Leavenworth, Kans., for duty with troops in the field, and return.

Dr. Harry H. Van Kirk, U.S.A., ordered from Fort Sill to Fort Logan.

Captain Sanford H. Wadhams, U.S.A., returned to Fort Slocum from Fort Mackenzie.

Dr. Francis M. Wall, U.S.A., granted two months leave.

Passed Assistant Surgeon U. R. Webb, U.S.N., ordered from the *Brooklyn* to the naval torpedo station.

Captain Walter D. Webb, U.S.A., ordered from Camp Columbia to report to the Surgeon General, U.S.Army, in Washington.

Surgeon C. P. Wertenbaker, P.H.&M.H.S., ordered from Quebec to St. John, N.B.

Acting Assistant Surgeon W. O. Wetmore, P.H.&M.H.S., ordered from Buffalo to Ellis Island.

Lieutenant A. M. Whaley, U.S.A., ordered to Fort Sam Houston.

Passed Assistant Surgeon C. W. Wille, P.H.&M.H.S., ordered from Gulf Quarantine to New Orleans and to Scranton, Miss., for special duty and return.

Assistant Surgeon W. J. Zalesky, U.S.N., ordered from the *Newport* to the Portsmouth Naval Hospital; order modified from the *Newport* to the U.S.T.B. *Stringham*.

THE NAVAL MEDICAL SCHOOL AND HOSPITAL.—The number of the *Army and Navy Register* for October 27, 1906, contains an interesting article descriptive of the new Naval Medical School Hospital and an excellent half tone engraving of the building, together with fine group engravings of the faculty and the student officers of the School.

THE NAVY MEDICAL DEPARTMENT.—Surgeon General Rixey urges in his annual report the establishment of a Nurse Corps, a Dental Corps, the increase of the Hospital Corps, the reapportionment of the Medical Corps so as to provide a larger number of officers in the higher grades, and the creation of a grade higher than Medical Director. He refers emphatically to the stagnation of promotion in his Department, and demonstrates clearly the need for more officers of the higher grades.

Current Literature.

TROPICAL TYPHOID.*

TYPHOID fever occupies so prominent a position in military medicine that it is well deserving of encyclopedic treatment by those medical men to whom it particularly appeals. In the words of Major Roberts, "hitherto our resources and efforts have been directed to the maintenance of our hospital services,—to the treatment of the sickness which we can and must prevent if the medical service is to fulfil its first and fundamental function; and nothing short of a radical reorganization and tactical redistribution of our resources will redeem the false situation created by the primitive conception of our duty which has survived from a pre-scientific era. In brief, a Sanitary Service must be organized, the scope and powers of which must be commensurate with the responsibility laid upon it, and to this end there must be perfect co-operation between the specialist in the various grades of the service and the whole body which it serves and for which it exists. No attempt to establish an independent providence arbitrarily divorced from the effectual source and exercise of its power—in the counsels of the administration and in the instructed intelligence of the individual units—will avail. This is emphatically a matter of national moment in which there must be no compromise, and no preventible opening left for the triumph of a better over the best attainable." The result of the approach to the subject indicated in the quotation is a monograph of the highest value. Historical, etiological and epidemiological phases are fully taken up, but particular emphasis is laid upon the necessity for prophylaxis. The lessons of recent hostilities

***Enteric Fever in India and in other Tropical and Sub-Tropical Regions.** By Major ERNEST ROBERTS, I.M.S. Small 4to; pp. 597, with numerous illustrations. London, Bailliere, Tindall & Cox, 1906.

are fully considered and the experience of other countries is amply recognized. No new methods are especially brought out, but great emphasis is laid upon the necessity for hygiene and careful sanitation in the production of prevention. The work is valuable in the extreme and may well be placed in the hands of every military medical officer.

KEEN'S SURGERY.*

THE appearance of an encyclopedic work on surgery under the editorship of Professor William Williams Keen is an event in surgical literature, which cannot be passed over lightly. The work is stated to be an unabridged treatise for the surgeon and the general practitioner. In its preparation Dr. Keen has associated with himself a rather larger number of contributors than is ordinarily the case in works of this kind, not confining himself to American authors, but going out liberally into foreign fields for men with special qualifications. In this manner he has been able to secure a high degree of scholarship and an exceptional weight of authority. Many of the authors appear for the first time as contributors to a surgical textbook, which gives to the context a freshness which is an interesting feature of the work. The first volume, after an interesting historical sketch by Mumford, takes up the usual subjects pertaining to general surgery, including surgical physiology and contusions and wounds by Crile; examination of the blood by John C. Da Costa; infection and immunity by Hektoen; inflammation by Adami; suppuration, ulceration and gangrene by Freeman; processes of repair by F. C. Wood; thrombosis and embolism, erysipelas, tetanus, special infections, and diseases from animals, insects and reptiles by Frazier; the traumatic fevers by E. A. Smith; rickets by E. H. Nichols; tuberculosis by Chalmers Da Costa; chancroid and syphilis by Edward Martin; and tumors by Bland Sutton. The discussion of the several subjects is full and complete, and the result is a work which will long survive as an authority worthy of constant consultation.

**Surgery, its Principles and Practice.* By various authors. Edited by WILLIAM WILLIAMS KEEN, M.D. Vol. I. 8vo; pp. 983, with 258 illustrations. Philadelphia and London, W. B. Saunders Co., 1906.

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